

Curriculum Vitae



Name: Keshav Kant Sahu
Date of Birth: November 24, 1972
Status: Married
Designation: Professor & Head
Address: School of Studies in Biotechnology
Pt. Ravishankar Shukla University
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Education:

1. High School Certificate, MP Board of Secondary Education, Bhopal - 1988.
2. Higher Secondary School Certificate, MP Board of Secondary Education, Bhopal - 1990.
3. Bachelor of Science (Biology), Pt. Ravishankar Shukla University, Raipur - 1993.
4. Master of Science (Bioscience, with specialization in Biotechnology, secured 3rd rank in the University Merit List), Pt. Ravishankar Shukla University, Raipur - 1995.
5. Post Graduate Diploma in Translation, Pt. Ravishankar Shukla University, Raipur - 1996.
6. Doctor of Philosophy (Bioscience, Subject area: Seed and Nursery Technology), Pt. Ravishankar Shukla University, Raipur - 2000.

Title of the Thesis: Physiological and Biochemical Aspects of Dieback in Sal (*Shorea robusta*) saplings

Research Centre: School of Life Sciences
Pt. Ravishankar Shukla University
Raipur 492 010, India

Ph. D. Supervisor: Prof. S. C. Naithani
School of Life Sciences
Pt. Ravishankar Shukla University
Raipur 492 010, India

Positions Held:

1. Junior Research Fellow (DST project), School of Life Sciences, Pt. Ravishankar Shukla University, Raipur, October 1995 - October 1998.
2. Research Fellow, School of Life Sciences, Pt. Ravishankar Shukla University, Raipur, November 1998 - October 1999.
3. Research Assistant, School of Life Sciences, Pt. Ravishankar Shukla University, Raipur, November 1999 - August 2003.

4. Lecturer, School of Life Sciences, Pt. Ravishankar Shukla University, Raipur, September 2003 - August 2007.
5. Senior Lecturer/ Assistant Professor, School of Life Sciences, Pt. Ravishankar Shukla University, Raipur, September 2007 - October 2012.
6. Associate Professor, School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur, November 2012 - November 2015.
7. Professor, School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur, November 2015 - till date.
8. Head of the Department, School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur, July 2019 - till date.

Awards/ Honors:

1. Recipient of “*Certificate of Appreciation*” for significant contribution in the progression of University, during Foundation Day Celebration, on May 01, 2007, from Pt. Ravishankar Shukla University, Raipur, administration.
2. International Travel Grant (full) received from Department of Science & Technology, Govt. of India, for oral paper presentation at 7th International Workshop on Desiccation Sensitivity and Tolerance Across Life Forms, South Africa (Ref: ITS/5071/2015-16, dated 02.12.2015).
3. Recipient of “*Associate Professor of the Year (Science) Award*” for the academic session 2015-16, during Teachers Day Celebration, on September 07, 2016, from Pt. Ravishankar Shukla University, Raipur, administration.

Member in Academic Bodies:

1. Member, DRC Life Sciences, Pt. RSU, Raipur (2010-12)
2. Member, DRC Biotechnology, Pt. RSU, Raipur (2010-till date)
3. Member, Board of Studies of Microbiology, Pt. RSU, Raipur (2011-14)
4. External Expert, Board of Studies of Life Science, MATS University, Raipur (2012-till date)
5. Member, Board of Studies of Biotechnology, Pt. RSU, Raipur (2014-17)
6. Vice-Chancellor’s Nominee in Examination Committee of B Sc/ M Sc in Biotechnology, of Pt. RSU, Raipur (2016-17)
7. Member, Teacher Benefit Fund Committee, Pt. RSU, Raipur (2016-till date)
8. Chairman, Board of Studies of Microbiology, Govt. Digvijay Autonomous PG College, Rajnandgaon (2016-till date)
9. Chairman, Board of Studies of Biotechnology, Pt. RSU, Raipur (2017-20)
10. Member, Academic Council, Pt. RSU, Raipur (2017-till date)
11. State Academic Coordinator for National Children Science Congress (Department of Science & Technology, New Delhi), nominated by Chhattisgarh Council of Science & Technology, Raipur (2018-20).
12. Chairman, Central Board of Studies of Biotechnology, Department of Higher Education, Government of Chhattisgarh, Raipur (2018-21)
13. Subject Expert, Board of Studies of Biotechnology, Govt. Nagarjun Post Graduate Science College, Raipur (2018-20)
14. Subject Expert, Board of Studies of Botany, Govt. Nagarjun Post Graduate Science College, Raipur (2018-20)
15. Member, Board of Studies of Biotechnology, Sant Gahira Guru University, Ambikapur, Sarguja (2018-20)
16. Member, Examination Committee of Biotechnology, Bastar University, Jagdalpur (2018-20)
17. External Subject Expert, Board of Studies of Biotechnology, Guru Ghasidas Central University, Bilaspur (2019-21)
18. Member, Academic Council, ITM University, Raipur (2019 onwards).
19. Member, Board of Studies of Biotechnology, Bastar University, Jagdalpur (2019-22)
20. Member, Academic Council (Autonomous Scheme) of Govt. Nagarjun Post Graduate Science College, Raipur (2020-22)

21. External Subject Expert, Board for School of Studies of Interdisciplinary Education & Research, Guru Ghasidas Central University, Bilaspur (2020-23)
22. Member, Standing Committee of Govt. Nagarjun Post Graduate Science College, Raipur (2020-22)
23. Member, Board of Studies of Biotechnology, Pt. RSU, Raipur (2020-23)
24. Member, Board of Studies of Biotechnology, AMITY University, Raipur (2021-23)
25. Member, Academic Council, Pt. RSU, Raipur (2021-24)

Member in Governing Bodies:

1. Member, Seth Phoolchand Agrawal College, Nawapara, Rajim (2021-23)
2. Alshums Infotech College, Nigri-Sihawa, Dhamtari (2021-23)

Administrative Responsibilities:

1. Assistant Coordinator, Central Valuation Unit, Pt. RSU, Raipur (2004)
2. Assistant Coordinator, Central Valuation Unit, Pt. RSU, Raipur (2005)
3. Assistant Coordinator, Revaluation Unit, Pt. RSU, Raipur (2006)
4. Assistant Coordinator, Revaluation Unit, Pt. RSU, Raipur (2007)
5. Assistant Coordinator, Revaluation Unit, Pt. RSU, Raipur (2008)
6. Secretary, Purchase Committee, SoS in Biotechnology, Pt. RSU, Raipur (2013-19)
7. Head of the Department, SoS in Biotechnology, Pt. RSU, Raipur (July 2019-till date)
8. Member, State Level Biodiversity Expert Committee, Department of Forest, Govt. of Chhattisgarh, Raipur (2021-till date)

Editorial Responsibilities:

1. Associate Editor, CSVTU International Journal of Biotechnology, Bioinformatics and Biomedical (2015-17).
2. Technical Editor, Biotechnology (Scopus Indexed journal of Science Alert)
3. Technical Editor, Asian Journal of Plant Sciences (Scopus Indexed journal of Science Alert)
4. Technical Editor, Pakistan Journal of Biological Sciences (Scopus Indexed journal of Science Alert)
5. Reviewer, Journal of Tropical Forest Science, by FRIM, Malaysia.
6. Reviewer, Plant Physiology and Biochemistry, by Elsevier (IF 3.9).
7. Reviewer, Journal of Plant Physiology, by Elsevier (IF 2.7)
8. Reviewer, African Journal of Agricultural Research, by Academic Journals.
9. Reviewer, Greener Journal, by Scandevian Society.
10. Reviewer, Plant Growth Regulation, by Springer (IF 1.67)
11. Reviewer, Fluoride, by International Society of Fluoride Research, New Zealand (IF 1.7)
12. Reviewer, Environmental Science & Pollution Research, by Springer (IF 3.4)
13. Reviewer, International Letters of Natural Sciences, by Sci Press, Switzerland (ISI indexed)
14. Reviewer, Bioremediation Journal, by Taylor and Francis (IF 0.85)
15. Reviewer, Ecotoxicology and Environmental Safety, by Elsevier (IF 3.1)
16. Reviewer, Defense Life Science Journal, by DRDO, New Delhi
17. Reviewer, Physiology & Molecular Biology of Plants, by Springer (IF 2.1)
18. Reviewer, Journal of Plant Interactions, by Taylor & Francis (IF 1.62)
19. Reviewer, Conservation Physiology, by Oxford Press (IF 2.32)
20. Member, Editorial Board of Integrative Molecular Biology and Biotechnology, by SCIAEON Publishing Group, UK.
21. Member, Editorial Board of World Journal of Nanoscience and Nanotechnology, by MedText Publications, USA.
22. Member, Editorial Board of Asian Journal of Botany, by En-Press Publications, Tustin, USA
23. Reviewer, Physiologia Plantarum, by Wiley (IF 2.58)
24. Reviewer, Ecotoxicology, by Springer (IF 1.98)

25. Reviewer, Biocatalysts and Agriculture Biotechnology, by Elsevier (IF 2.19)
26. Reviewer, South African Journal of Botany, by Springer (IF 1.6)
27. Reviewer, BMC Microbiology, by Springer Nature (IF 3.2)
28. Reviewer, Plant Cell Reports, by Springer (IF 3.07)
29. Reviewer, Journal of Hazardous Materials, by Elsevier (IF 9.01)
30. Reviewer, Molecular Biology Reports, by Springer (IF 2.1)

External Examiners of Ph. D. Thesis:

1. Sant Gadge Baba Amravati University, Amravati, Maharashtra
2. University of Kwa-Zulu, Natal, Durban, South Africa
3. Dr Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra
4. Shivaji University, Kolhapur, Maharashtra
5. Central University of Allahabad, Allahabad, Uttar Pradesh
6. Savitribai Phule Pune University, Pune, Maharashtra
7. Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra
8. Sambalpur University, Jyotivihar, Burla, Odisha
9. Panjab (Central) University, Chandigarh

Teaching Experience:

UG teaching: 3 years (2006-09).

PG teaching: more than 17 years (2000-till date)

Dealt/ Dealing with;

Seed Technology	M Sc Biotechnology (2003-04)
Plant Physiology	M Sc Bioscience (2003-12)
Developmental Biology	M Sc Bioscience (2003-12)
Plant Biochemistry	M Sc Biochemistry (2005-12)
Computer Application in Biology	M Sc Bioscience/ Microbiology/ Biochemistry (2005-12)
Biostatistics & Computer Application	M Sc Biotechnology (2013-till date)
Cell Biology	M Sc Biotechnology (2013-till date)
Functional Genomics & Proteomics	M Sc Biotechnology (2013-till date)
Applied Biotechnology	M Phil & Ph D course work in Biotechnology (2013-till date)

Member in Professional Bodies:

1. Indian Society of Plant Physiologists, New Delhi
2. Indian Society of Tree Scientists, Nauni-Solan
3. Academy of Plant Sciences, Muzaffarnagar
4. Hind Agri-Horticultural Society, Muzaffarnagar
5. Alumni Association, School of Life Sciences, Pt. RSU, Raipur
6. Teachers Association, Pt. RSU, Raipur

Thrust Areas of Research:

1. Age induced metabolic amendments in tropical tree seeds.
2. Post harvest handling and storage of tropical tree seeds.
3. Raising and maintenance of nursery of tropical tree species.
4. Heavy metal imposed injuries in seeds/ seedlings.
5. Salinity induced responses in seeds/ seedlings.
6. Propagation and conservation of medicinal plants.
7. Microbial remediation of heavy metals and pesticides.

Research Guidance:

PDF:

1. Neha Pandey (SERB-NPDF) Efficacy of alginate encapsulated plant growth promoting bacterial consortia against arsenic toxicity in *Oryza sativa* L. 2017

Ph D:

Awarded

1. Suruchi Parkhey (UGC-BSR Fellow) ROS mediated lipid peroxidation, protein carbonylation and DNA fragmentation in *Shorea robusta* seeds during natural ageing 2014
2. Shweta N. (CGCOST Fellow) Domestication and molecular identification of pesticide resistant soil indigenous bacteria 2018
3. Ravishankar Chauhan (UGC-RGNF Fellow) Clonal propagation and long term conservation of *Chlorophytum borivilianum* Sant et Fernand 2018
4. Vibhuti Chandrakar (DST-INSPIRE Fellow) Arsenic induced metabolic dysfunction, growth inhibition and its amelioration in *Glycine max* L. 2018
5. Jipsi Chandra (UGC-NF Fellow) Biochemical and molecular mechanisms involved in the affliction of longevity of Mahua (*Madhuca latifolia*) seed 2019
6. Bhumika Yadu (DRDO Fellow) Fluoride-induced metabolic and molecular modifications and its management in *Cajanus cajan* L. 2019
7. Roseline Xalxo (UGC-RGNF Fellow) Phytotoxic impacts of simulated acid rain and lead on growth and oxidative metabolism of *Trigonella foenum-graecum* seedlings 2020

Registered

1. Priya Katiyar (UGC-JRF) Plant growth promoting bacteria and systemic tolerance to fluoride toxicity in *Oryza sativa* L. 2018
2. Rasleen Kaur (CGCOST Fellow) Modulation in gene expression and hormonal responses by nanoparticles for resurgence of aged *Cajanus cajan* Seeds 2019
3. Anita Bhoi (UGC-JRF) Development of ligand conjugated bioactive loaded metallic nanocarriers targeting oxidative stress-induced inflammation in Rheumatoid Arthritis 2021

M Phil:

1. Trilok Sukhdev (UGC-RGNF Fellow) Antioxidant activity, flavonoid and phenolic contents in leaves and roots of *R. serpentina* and *W. somnifera* 2008
2. Arun Kumar Sahu Influence of salt stress on antioxidant defense system, superoxide radical, lipid peroxidation, protein and its carbonylation in germinating *Cicer arietinum* seeds 2009
3. Deepa Biswas Effects of Al³⁺ on oxidative stress related antioxidant enzymes activities in *Cicer arietinum* seeds 2010
4. Priyanka Dewangan Reactive oxygen species metabolism during accelerated ageing of *Cicer arietinum* seeds 2011
5. Mamta Tandon (UGC-RGNF Fellow) Role of protein and DNA oxidation during loss and re-establishment of desiccation tolerance in germinated *Pisum sativum* seeds 2012
6. Shristi Yadu Salicylic acid and salinity tolerance in *Pisum sativum* seeds 2014
7. Mona Tandon Desiccation promoted reduction in metabolic inequity in *Cicer arietinum* radicles 2014

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|----|-----------------|---|------|
| 8. | Piu Chakraborty | Nickel elicited oxidative damage in germinating <i>Pennisetum typhoideum</i> seed | 2014 |
| 9. | Sneha Kulbhaje | Influence of organophosphates and arsenic on key enzymes of biogeochemical cycles | 2015 |

M Sc (Dissertation):

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|-----|--------------------|--|------|
| 1. | Vandana Kropi | Dehydration damage and repair in imbibed <i>Cicer arietinum</i> seeds. | 2006 |
| 2. | Renu Sahu | Optimum temperature for germination of <i>Cicer arietinum</i> and <i>Phaseolus aureus</i> seeds | 2007 |
| 3. | Sarita Tripathi | Reversal of germination percentage in accelerated ageing seeds of <i>Cicer arietinum</i> by priming | 2008 |
| 4. | Mukta Rao | Review on: ROS mediated lipid, protein and DNA oxidation in plants | 2010 |
| 5. | Balram Sahu | Gram seed deterioration: assessment of some physiological and biochemical aspects | 2011 |
| 6. | Isha Sharma | Reactive oxygen species and DNA damage | 2011 |
| 7. | Gunjan Rughani | Production and localization of ROS in assorted seeds indulged with different abiotic stress | 2014 |
| 8. | Ritu Sahu | Influence of insecticide(s) and metalloids on total microbial population, total protein content and dehydrogenase activity of the soil | 2016 |
| 9. | Teman Lal Dewangan | Efficacy of salicylic acid and nitric oxide in conferring salt stress tolerance to <i>Pisum sativum</i> L. | 2016 |
| 10. | Richa | Dimethylthiourea antagonizes oxidative responses of arsenic by inflating the antioxidative system | 2017 |
| 11. | Jeabunnisha Khan | Ameliorative implications of silver nanoparticles on artificially aged seeds of <i>Cicer arietinum</i> | 2019 |
| 12. | Deepali Nagre | Melatonin attenuates arsenic toxicity via antioxidants in <i>Cicer arietinum</i> L. | 2019 |
| 13. | Ankita Tiwari | Synthesis and characterization of antimicrobial activity of silver nanoparticles | 2020 |
| 14. | Naaz Fatima | Isolation of DNA for RAPD analysis from fresh leaves of three different <i>Ocimum</i> species | 2020 |
| 15. | Shreya Gupta | Assessment of antioxidant and antimicrobial activities of some of the fruits and medicinal plants | 2021 |
| 16. | Aajila Thara | Phytotoxic impacts of 2,4-Dinitrotoluene on growth and metabolism of <i>Vigna radiata</i> L. seeds | 2021 |

Research Project/ Grant Support Received:

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|----|--|-----------------|--------------|---------|
| 1. | Molecular markers for characterization of dieback in Sal (<i>Shorea robusta</i>) seedlings: protein and antioxidant enzyme profile | CGCOST, Raipur | Rs 1.89 Lakh | 2006-08 |
| 2. | ROS mediated lipid peroxidation, protein oxidation and DNA fragmentation in <i>Shorea robusta</i> seeds during natural ageing | UGC, New Delhi | Rs 4.25 Lakh | 2012-15 |
| 3. | Telomere and genotoxic effects of Arsenic in germinating <i>Glycine max</i> L. seeds | CGCOST, Raipur | Rs 5.00 Lakh | 2015-17 |
| 4. | Assessment of efficacy of bacterial slurry (pro-biotic) as deterrent to diseases, pests (agro-bioterrorism), plant growth regulator and bio-fertilizer | DRDO, New Delhi | Rs 8.72 Lakh | 2016-18 |

5.	Efficiency of encapsulated soil bacterial consortia in reducing Arsenic toxicity and growth promotion of <i>Oryza sativa</i> L.	CGCOST, Raipur	Rs 5.00 Lakh	2017-20
6.	Bacterial bioreporters for detection of landmines vapors	DRDO, New Delhi	Rs 32.87 Lakh	2018-21
7.	Documentation of wetlands of the Chhattisgarh State	CG Govt. Raipur	Rs 3.25 Lakh	2019
8.	Bioremediation and bioelectricity generation from effluent wastewater and kitchen waste in microbial fuel cell using indigenous bacterial strain(s)	CGCOST, Raipur	Rs 5.00 Lakh	2019-22

Conference/ Symposia/ Course Organized:

1. National Symposium on Biodiversity: Current Status and Prospects, October 17-18, 2005.
2. National Conference on Advances in Biological Sciences, November 5-7, 2011.
3. National Conference on Traditional Knowledge and Biotechnology, November 22-24, 2013.
4. National Seminar on Innovations and Prospects in Biotechnology, January 2-4, 2016.
5. One Day Workshop on Opportunities and Entrepreneurship in Biotechnology, March 31, 2017.
6. One Day Workshop on Brewing Bio-entrepreneurship in Raipur, August 29, 2019.
7. National Conference on Recent Advances & Trends in Biotechnology, January 10-12, 2020.
8. Multidisciplinary Refresher Course in Life Sciences: Synthetic Biology, December 14-28, 2020.
9. Multidisciplinary Refresher Course in Biotechnology, December 13-28, 2021.

Guest/ Invited Lectures Delivered:

1. Conservation of plant genetic resources using vitrification based cryopreservation. National Conference on Biological Sciences in Present Scenario, Department of Biotechnology, St. Thomas College, Bhilai, October 10 - 11, 2012.
2. Molecular markers of seed ageing. National Seminar on Recent Trends in the Thrust Areas of Life Sciences, Department of Bioscience, Sri Guru Tegh Bahadur Khalsa College, Jabalpur, January 10 - 11, 2015.
3. Molecular markers of heavy metal toxicity. National Seminar on Innovation and Research in Science, Management and Technology, Department of Microbiology and Computer Science, Bilaspur University, Bilaspur, March 29 - 30, 2015.
4. Prospects in Biotechnology and Zoology. Department of Biotechnology and Zoology, Govt. Digvijay College, Rajnandgaon, September 01, 2015.
5. Seeds: Fascinating vehicle of life. Refresher Course in Botany, Organized by Academic Staff College, Pt. Ravishankar Shukla University, Raipur, November 23, 2015.
6. Insights of electrophoresis and 2-DE. Refresher Course in Botany, Organized by Academic Staff College, Pt. Ravishankar Shukla University, Raipur, November 27, 2015.
7. Popular tools for data analysis: Conceptual outline. National Workshop on Research Methodology and Tools, Organized by Bilaspur University, Bilaspur, June 25 - 30, 2016.
8. Electrophoresis, an efficient separation technique. Department of Botany and Microbiology, Govt. Digvijay P.G. College, Rajnandgaon, November 10, 2016.
9. Chaired a technical session of National Seminar on Advances in Environmental Science and Technology, organized by Department of Botany, Govt. Digvijay P.G. College, Rajnandgaon, January 23 - 24, 2017.
10. Guest Lecture on Enzymes: Extraction to application. National Workshop on Enzymology and its Applications (Isolation, Purification and Immobilization of Enzymes Amylase and Lipase) from Various Sources, during National Workshop, Organized by Bhilai Mahila Mahavidyalaya, Bhilai, and Nitza Bioventure Pvt. Ltd., Secunderabad, January 12 - 18, 2018.

11. Chaired a technical session of National Seminar on Nanotechnology to Translational Nanomedicine: Status Assessment, Challenges and New Horizons, Organized by Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur, March 15 - 17, 2018.
12. Lecture on Heavy metal toxicity in plants and its management strategies. Refresher Course in Life Sciences, Organized by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur, July 09, 2018.
13. Chaired a technical session of International Conference on Innovative Research in Science, Management and Technology, Organized by Bilaspur University, Bilaspur and MTMI Inc., USA, August 4 - 5, 2018.
14. Guest Lecture on Management of heavy metal toxicity in crop plants: Recent innovations, during National Conference on Research Interventions in Biotechnology and their Applications in Sustainable Resource Utilization, Organized by Rungta College of Science & Technology, Durg, September 07, 2018.
15. Resource Person for conducting a Workshop on RT-PCR, during International Conference on Fostering Interdisciplinary Research in Medicines, Organized by University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur, January 19 - 21, 2019.
16. Resource Person for Quantitative Data Analysis, during Workshop *cum* Pre Ph.D. Course work on Research Methodology and Computing, organized by Atal Bihari Bajpayee University, Bilaspur, 25 May to 3 June, 2019.
17. Invited Lecture on Management of Heavy Metal Toxicity in Crops, during 2nd International Conference on Fostering Interdisciplinary Research in Health Sciences 2019, organized by AIMST University, Bedong, Kedah Dar, Malaysia, September 14 - 15, 2019.
18. Lecture on Heavy metal stress & its management for improved crop production. Refresher Course in Life Sciences, Organized by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur, December 06, 2019.
19. Invited Lecture on Enzymes: Extraction to Applications, during National Seminar on Recent Advances & Current Trends in Life Sciences, organized by Govt. BSBA College, Dongargaon, February 13, 2020.
20. Invited Lecture on Molecular Markers of Seed Ageing, during International Conference on A New Microbiome Research Era for Human Welfare & Cure of Infectious Diseases, organized by Shri Shakaracharya Mahavidyalaya, Bhilai, February 28 - 29, 2020.
21. Invited Lecture on Approaches for Diagnosis and Management of Heavy Metal Toxicity for Improved Production, during One Day National Seminar on Recent Trends in Plant Sciences, organized by Sir Sayyed College of Arts, Commerce & Science, Aurangabad, Maharashtra, January 03, 2021.
22. Lecture on Planning and writing research projects, funding opportunities and involving students in research. Faculty Development Program, Organized by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur, February 19, 2021.
23. Lecture on Research ethics, academic integrity, informed consent and conversion of thesis into publication ready paper. Faculty Induction Program, Organized by Human Resource Development Centre, Pt. Ravishankar Shukla University, Raipur, February 22, 2021.
24. Invited Lecture on Novel Strategies for Management of Metal Toxicity in Plants, during National Webinar on Future of Science, Technology and Innovation: Impacts on Education, Skills and Work, organized by Sri Guru Tegh Bahadur Khalsa College, Jabalpur, Madhya Pradesh, February 28 - March 02, 2021.
25. Invited Lecture on Biotechnological Interventions in Combating Water Scarcity Condition and for Food Security, during National Webinar on Need and Feasibility of Water Conservation, organized by Govt. Shivnath Science College, Rajnandgaon, June 19, 2021.
26. Invited Lecture on Post Harvest Processing, Storage and Deterioration, during Online Certificate Program on Seed Science and Technology, organized by Department of Botany, St. Thomas College, Bhilai, July 05-21, 2021.

27. Invited Lecture on Proteomics: Versatile Approach for Disease Diagnosis and Human Welfare, during 15 Days Certificate Course on Biostatistics, Internet Applications, Instrumentation and Techniques for Young Researchers, organized by Department of Microbiology, Swami Shree Swaroopanand Saraswati Mahavidyalaya, Hudco, Bhilai, July 15-29, 2021.
28. Invited Lecture on Novel Approaches for Managing Ill Effects of Heavy Metals in Plants, during International Conference on Sustainable Development and Recent Advances in Biotechnology and Bioscience, organized by Department of Biotechnology, Kalinga University, Naya Raipur, 22 October 2021.
29. Lecture on Effects of Heavy Metal Exposure in Plants and their Management Approaches. Refresher Course in Life Sciences, Organized by Human Resource Development Centre, Sant Ghadage Baba Amravati University, Amravati, Maharashtra, November 12, 2021.
30. Lecture on Seeds: Fascinating Vehicles of Life. Refresher Course in Life Sciences, Organized by Human Resource Development Centre, Sant Ghadage Baba Amravati University, Amravati, Maharashtra, November 12, 2021.

Events Attended in Abroad:

1. 7th International Workshop on Desiccation Sensitivity and Tolerance Across Life Forms. Organized by School of Life Sciences, University of Kwazulu-Natal, Durban, South Africa, at Aquila Private Game Reserve, Cape Town, South Africa, January 10-15, 2016.
2. 2nd International Conference on Fostering Interdisciplinary Research in Health Sciences 2019, organized by AIMST University, Bedong, Kedah Dar, Malaysia, September 14-15, 2019.

Publications:

Research/ Review Papers:

1. KS Krishna Chaitanya, **S. Keshavkant** & SC Naithani (2000) Changes in total protein and protease in dehydrating recalcitrant sal (*Shorea robusta*) seeds. *Silva Fennica*, 34: 71-77. **{SCI IF: 1.68}**
2. **S. Keshavkant** & SC Naithani (2001) Chilling-induced oxidative stress in young sal (*Shorea robusta*) seedlings. *Acta Physiologiae Plantarum*, 23: 457-466. **{SCI IF: 2.35, NAAS IF: 7.76}**
3. **S. Keshavkant** & SC Naithani (2005) Low temperature induced alteration in growth pattern and mortality in young sal (*Shorea robusta*) seedlings. *Journal of Tree science*, 24: 69-78. **{NAAS IF: 1.0}**
4. R Naithani, B Varghese, **S. Keshavkant**, ME Dulloo & SC Naithani (2006) Post harvest storage physiology of *Gmelina arborea* seeds. *Indian Journal of Plant Physiology*, 11: 20-27. **{NAAS IF: 5.50}**
5. **S. Keshavkant** & SC Naithani (2007) Changes in sugar metabolism in response to chilling in *Shorea robusta* seedlings. *International Journal of Plant Sciences*, 2: 161-168. **{NAAS IF: 2.2}**
6. **S. Keshavkant** & SC Naithani (2007) Low temperature induced changes in the Phenolic contents and its regulatory enzymes in sal seedlings. *Indian Journal of Plant Physiology*, 12: 146-152. **{NAAS IF: 5.50}**
7. PK Sharma, M Kukreja, **S. Keshavkant** & R Gothwal (2007) Taxoethanobotanical values of some plants of Chhattisgarh. *Advances in Biological Sciences*, 6: 37-38.
8. PK Sharma & **S. Keshavkant** (2008) Farm production of *Trichoderma harzianum* T-64 using different organic materials from Hilly Zones of Chhattisgarh. *Advances in Plant Sciences*, 21: 39-41. **{NAAS IF: 2.90}**
9. PK Sharma & **S. Keshavkant** (2008) Comparative study of antagonistic activity of *Trichoderma species* against *Rhizoctonia solanii*. *International Journal of Plant Sciences*, 3: 163-165. **{NAAS IF: 7.0}**

10. S Sharma, R Naithani, B Varghese, **S. Keshavkant** & SC Naithani (2008) Effect of hot water treatment on seed germination of some fast growing tropical tree species. *Journal of Tropical Forestry*, 24: 49-52. {NAAS IF: 4.16}
11. **S. Keshavkant**, T Sukhdev, Ch Srinivasarao & SC Naithani (2008) Antioxidant activities, phenols and flavonoid contents of *Withania somnifera* and *Rauwolfia serpentina*. *Indian Journal of Plant Physiology*, 13: 394-399. {NAAS IF: 5.50}
12. **S. Keshavkant** & SC Naithani (2010) Chilling induced superoxide production, lipid peroxidation and leakage loss in *Shorea robusta* seedlings. *Indian Journal of Plant Physiology*, 15: 191-196. {NAAS IF: 5.50}
13. **S. Keshavkant**, J Padhan, S Parkhey & SC Naithani (2012) Physiological and antioxidant responses of germinating *Cicer arietinum* seeds to salt stress. *Russian Journal of Plant Physiology*, 59 (2): 206-211. {SCI IF: 1.48, NAAS IF: 7.6}
14. Suruchi Parkhey, SC Naithani & **S. Keshavkant** (2012) ROS production and lipid catabolism in desiccating *Shorea robusta* seeds during natural ageing. *Plant Physiology and Biochemistry*, 57: 261-267. {SCI IF: 4.27, NAAS IF: 9.72}
15. Suruchi Parkhey, SC Naithani & **S. Keshavkant** (2014) Protein metabolism during natural ageing in desiccating recalcitrant seeds of *Shorea robusta*. *Acta Physiologicae Plantarum*, 36: 1649-1659. {SCI IF: 2.35, NAAS IF: 7.76}
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Brief Review of the Research Contributions:

The foremost focus of our research team involves the study of abiotic stress mediated physiological, biochemical and molecular changes in germinating seeds as well as seedlings of various crops. Our group is also attempting to explore the exact molecular mechanisms of active oxygen species {AOS} induced alterations occurring in various macromolecules *viz.*; lipids, proteins and nucleic acids, during post harvest storage of seeds, more particularly of recalcitrants. We have further extended our interest in unraveling and elucidating the basic mechanisms of salt and heavy metal imposed molecular disturbances in germinating seeds of some of the crops. After conducting a good number of studies, we have come out with a conclusion that AOS are the potential responsible molecules conferring disorders in both biomolecules and plasma membrane of a cell, under salt and heavy metal induced stresses in seeds/ seedlings. Keeping in mind, our group has successfully ameliorated the toxic effects of salinity and heavy metals/ metalloids following the use of few of the potential chemicals and chemically synthesized silver, silica and titanium nanoparticles in some of the plant species.

Our research group, for the first time, has demonstrated that low temperature was the foremost cause responsible for inducing dieback (for 3-20 years) in majority [80%] of the sal (*Shorea robusta*) seedlings, a tree species of largest forest cover [44%] in India. This knowledge was applied to develop and standardize the tailor-made nursery practices for sal using plant growth regulators. We are now attempting to identify the low-temperature regulated genes/ proteins those are perhaps involved for dieback in sal seedlings and contribute in its being robust[a]. The Chhattisgarh being the herbal state of India, we have also initiated work on potential molecules of healing herbs. Our work on *Withania somnifera* and *Rauwolfia serpentina* revealed exceptionally high levels of some of the important antioxidants. Work is in progress to establish the relationship between antioxidants of these herbs and their medicinal importance in the selected diseases.

Further, looking to the commercial as well as medicinal importance, and uneven harvesting of *Chlorophytum borivillianum*, one of the very important medicinal herbs, for extraction of active gradients, our research group has successfully developed efficient *in-vitro* propagation protocol, slow growth protocol for long term storage of *in vitro* cultures, cryopreservation protocol and procedure for enhanced production of secondary metabolite in it.

In addition, our group has also conducted extensive research on bioremediation of arsenic, fluoride and pesticides like cypermethrin and chlorpyrifos. Conducted work dealt with the isolation and identification/ characterization of arsenic, cypermethrin and chlorpyrifos resistant bacterial strains from soil samples of Central India, and study of their efficacies to remove/ degrade these contaminants under *in vitro* conditions. Efforts have also been made to understand the fate of arsenic and fluoride, separately, in bacteria in an attempt to find applications in treating metal toxicity-induced alterations in metabolism of Rice plant.

Recently, I have been received an assignment/ established an Industrial Collaboration with the Life Sciences & Technology Centre, ITC Limited, Bangalore, Karnataka, for testing and development of a few of the nutraceutical products.

(Keshav Kant Sahu)
31 December 2021