

Department of Biotechnology

Dr. BHUPENDRA NATH TIWARY
Professor of Biotechnology



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Professional Overview:

Professor of Biotechnology Guru Ghasidas Vishwavidyalaya, Bilaspur
Reader in Botany, Patna University, Patna
Post Doc: Sheffield Univ., UK, Molecular Biology & Biotechnology
Lecturer in Botany, Patna University, Patna
Research Associate (UGC) Barkatullah Vishwavidyalaya, Bhopal
Ph.D.: Patna University, Fungal genetics & Molecular Biology
M.Sc.: Patna University, Botany

11.06.2007-26.11.2012
10.07.1995-10.06.2007
1989-1990
10.07.1987- 09.07.1995
13.08.1986 - 09.07.1987
1986
1978

Field(s) of Specialization:

Microbial & Molecular Genetics,
Microbial Biodiversity & Biotechnology,
Environmental Biotechnology

Teaching Experience:

(a) UG (Hons) Course : 25 years
(b) PG Course : 25 years
Experience of Guiding Research : 25 Years

No. of Scholars Supervised for Ph.D. : 09
No. of Scholar Registered for Ph.D. : 03
No. of M.Sc. Dissertation supervised : 23
Research Projects (Completed) : 04
Research Project (Ongoing) : 01

S. No.	Project Title/Position	Funding Agency	Year of Sanction	Duration	Status
1.	Biochemical genetics of phenylalanyl-tRNA synthesis of <i>Aspergillus nidulans</i> (As principal investigator)	Department of Science & Technology (DST) Government of India	1992	02 year	Completed 1994
2.	Microbial Biodiversity Consortium Network (MBCN) of Bihar (A Multi institutional Project)(As project co-coordinator)	Department of Biotechnology (DBT), Government of India	2004	03 Year	Completed 2007
3.	Assessment of Microbial load of the herbal drug Triphala and the use of Y-irradiation to enhance its shelf-life and efficacy (As Principal Investigator)	BRNS/BARC, Department of Atomic Energy (DAE), Government of India	2005	02 Year	Completed 2007
4.	Purification & Characterization of Bioactive compounds from wild lignicolous mushrooms from Achanakmar-Amarkantak	CG Council of Science & Technology (CCOST)	2010	02 Years	Completed 2012

	Biosphere Reserve				
5.	Process optimization of conditions for extraction and purification of lignin from agro and forest wastes using physico-chemical and biological approaches (As principal investigator)	UGC Major Research Project	2011	03 Years	On-going
6.	Studies on the diversity of entomopathogenic fungi of Chhattisgarh: Understanding the molecular mechanism of Entomopathogenesis for Bioprospecting (As principal investigator)	Department of Biotechnology (DBT), Government of India	2012	03 Years	Sanction Awaited

Research Collaborations:

- MTCC & Gene Bank, IMTECH, Chandigarh
- IARI, New Delhi
- Baba Gadge Amravati University, Amravati (MS)
- Department of Physical Anthropology, Pt. Ravi Shankar Shukla University, Raipur

Awards & Medals:

- Awarded **National Merit Scholarship** for securing position in the Merit List of Bihar School Examination Board from 1972-1976.
- Awarded **Patna University Merit Scholarship** for securing third position in I Class in B.Sc. (Hons.) Examination from 1976-1978.
- Awarded **Junior Research Fellowship (JRF) of the UGC** from 1981-1983.
- Awarded **Senior Research Fellowship (SRF) of the UGC** from 1983-1986.
- Awarded **Research Associateship (RA) of the UGC** from 1986-1987.
- Awarded **Young Scientist Medal** jointly by MP Council of Science & Technology (MPCST) and Department of Science & Technology (DST), Government of India in 1987.
- Awarded **Commonwealth Fellowship for Post-Doctoral Research by British Council Division, Commonwealth Scholarship Commission to work in the University of Sheffield, UK** in 1989.

Membership of the Learned Bodies:

- Life Member, Indian Science Congress Association
- Life Member & Fellow of International Society of Conservation of Natural Resources
- Life Member, Indian Society of Microbiologist
- Member, American Society of Microbiology (ASM)
- Member, Fungal Genetics Stock Centre (FGSC), USA

Other Academic/Administrative Experiences in Patna University (1987-2007):

- Professor-in-Charge, Microbial & Mol. Genetics Lab, Department of Botany, Patna University since 1990.
- Organizing Secretary of two National Seminars and one workshop.
- Nominated Member of the Committee constituted by the Vice-Chancellor, Patna University to formulate byelaws and curriculum for the P.G. Department of Biochemistry in 1999.
- Assistant Superintendent, Newton House, Science College, Patna University from 2001
- Co-ordinator, "Refresher Course in Biotechnology" organized by the UGC, Academic Staff College, Patna University in 2004.
- Project Co-ordinator, Multi-institutional Research Project entitled "Microbial Biodiversity Consortium.
- Network (MBCN) of Bihar" funded by Department of Biotechnology, Government of India in 2004
- Elected (Teacher) Member, Patna University Senate in 2005.
- Elected (Teacher) Member, Patna University Finance Committee in 2005.
- Member, Finance Committee, Patna University
- Chief Coordinator, Self-Financing Courses in Patna University in 2006-2007.
- Coordinator, Department of Biotechnology in Patna University in 2006-2007.
- Member, Advisory Committee on Higher Education constituted by HE, the Governor-cum-Chancellor, Bihar

Administrative Experience in Guru Ghasidas Vishwavidyalaya (GGV), Bilaspur (2007-contd):

- Professor & Head, Department of Biotechnology (Since June 2007)
- Dean, Faculty of Natural Resources (2007-2009)
- Member of Academic Council (2007-2009)
- Member, Standing Committee of Academic Council (2007-2009)
- Member of the Executive Council (2007-2009)
- Member of the Academic Council of GGV (A Central University) (2009-contd)
- Dean, School of Life Science (2009-contd)
- Head (in-Charge), Departments of Botany, Zoology and Anthropology & Tribal Development in GGV (2009-contd)
- Member of the Standing Committee of Academic Council of GGV (A Central University) (2009-contd)
- Member, Central Purchase Committee of GGV, Bilaspur
- Member, Central Purchase Committee of GGV, Bilaspur
- Member, Advisory Committee of CHiPS and CCOST, Government of Chhattisgarh
- Coordinator, UGC-CSIR NET Coaching, GGV, Bilaspur

Other Academic/Administrative Assignments:

- External Member Member, Board of Studies in Biotechnology, Jiwaji University, Gwalior
- Reviewer of a number of Indian and Foreign Journals related to Microbial Technology
- Worked as Elected Recorder of Environmental Science Section of ISCA (2007-2009)

Current Areas of Research:

- Microbial diversity of sites contaminated with heavy metals and xenobiotics
- Purification, characterization and identification of novel bioactive compounds from plants, Wild lignicolous Mushrooms and novel microorganisms
- Isolation and characterization of microorganisms (fungi and nematodes) showing potential as biopesticides, biofertilizers and other useful commercial products.

Significant Contributions made in the Development of the Department/Institution:

- Explored **three diverse mechanisms for the development of resistance to Antimetabolites** in eukaryotes using *Aspergillus nidulans* (an ascomycetous fungus) as the genetic test system (**Ref. Current Microbiology. 1987, 15:305-311**).
- **Proposed a model for explaining the Polymeric nature of aromatic amino acid permease in eukaryotes** on the basis of interaction studies between different genes concerned with amino acid uptake in *Aspergillus nidulans* (**Ref. Biologisches Zbl. 1989, 108:77-81**).
- Made **first report of the identification and functional characterization of a gene (fpaU) involved in the synthesis of α -subunit of Phenylalanyl-tRNA synthetase of *Aspergillus_nidulans*** (**Ref. Molecular & General Genetics. 1987, 209:164-169**).
- Reviewed the research work done in the field of **“Fungal Physiology and Biochemistry”** In India that forms one of the Chapters of the **Reference Book entitled “BOTANY IN INDIA:History & Progress”**, Edited by Professor BM Johri in 1994, Oxford & IBH Publishers, New Delhi.
- Have **edited two books**, which include review articles on diverse topics of Plant Sciences In general and Molecular Biology & Biotechnology, in particular, contributed by scientists of National and International repute.
- Have been instrumental in establishing **Patna University Botanical Society** with the aims of making Botany teaching more interactive by organizing seminars, workshops etc., Publication of its **Journal “The Botanical Bulletin”** and served as the **first President of the Society** during 1982-1985.
- Have worked as a **member of the Committee constituted by the Vice-Chancellor, Patna University to develop curriculum and frame the bye-laws to establish a separate Post-graduate Department of Biochemistry** under the Faculty of Sciences in Patna University.
- Have been the **Organising Secretary of three National Seminars and two National Workshop** held in the Department of Botany, Patna University and Bihar Council on Science & Technology, Ministry of Science & Technology, Government of Bihar and in the Guru Ghasidas University, Bilaspur.
- Have been a **member of the panel constituted by the Bihar Council on Science & Technology, Ministry of Science & Technology, Government of Bihar** to prepare the **“Draft Policy for Biotechnology in the State of Bihar”**.
- Worked as the **Chief Co-ordinator of a Multi-institutional Project entitled “Microbial Biodiversity Consortium Network (MBCN) of Bihar”** funded by the **Department of Biotechnology, Government of India** with the objective of investigation, preservation and documentation of the diverse microbes of different ecosystems of Bihar and assessment of their potentials in agriculture and industries.
- Have **worked as Principal Investigator of a Project on Herbal drug Triphala** funded by **Board of**

Radiation & Nuclear Science (BRNS/BARC), Department of Atomic Energy (DAE), Government of India with the aim to assess its microbial load, the toxins and optimization of conditions for radiation hygienization using γ -irradiation.

- Have **isolated, identified 7 new strains of agriculturally important soil bacteria and deposited the rDNA sequence data of two novel biovars of *Agrobacterium tumefaciens* to International Gene Bank, Maryland, USA in 2006, first such data submission for any organism from the soil of Bihar.**
- Have been associated with State Council of Educational Research & Training (SCERT) and Sri Krishna Science Centre, Patna as the **Resource Person to train teachers of +2 Schools** as well as **nominated in the Panel of Judges during National Level Science (Model & Chart) Competitions** for school children.
- Have been working as **In-Charge, Microbial & Molecular Genetics Lab, Department of Botany, Patna University**, since 1991.
- Have been teaching Microbiology, Molecular Genetics and Recombinant DNA Technology in the UGC Centre for Biotechnology, B.N. College and Postgraduate Department of Biochemistry, Patna University as the Guest Faculty.
- Have guided a number of students of B.Sc. & M.Sc. courses from different institutions for their “on the Job Training” on various topics related to Industrial Microbiology, Microbial Diversity & Biotechnology.
- Have got sanction of two separate self-financing M.Sc. courses in Industrial Microbiology and Bioinformatics in Guru Ghasidas University under XI Plan period to provide job-oriented training to students

Recent Research Publications (Last 5 years):

- **Tiwary BN**, Kumar Sanjay, Prasad B, Ghosh Anuradha & Jain RK (2007) Characterization of two novel Biovar of *Agrobacterium tumefaciens* isolated from root nodule of *Vicia faba*. *Current Microbiology* 55:328-333
- Kumari Nirupa, Prasad B & **Tiwary BN** (2007) Isolation and characterization of hyper-amylase producing strain *Streptomyces clavifer* MTCC 7778. *Columban J Life Sciences* 8(1):56-61.
- **Tiwary BN**, Prasad B, Kumari N, Kumar P, Mitra D & Varshney L (2008) Studies on effects of γ radiation processing of herbal formulation Triphala. *Journal of Food Science (Springer)* 74: M109-113.
- Anand R, Prasad B, **Tiwary BN** (2009) Relative susceptibility of *Spodoptera litura* pupae to selected entomopathogenic fungi. *Biocontrol (Springer)* 54: 85-92.
- Anand R & **Tiwary BN** (2009) Pathogenicity of entomopathogenic fungi to eggs and larvae of *Spodoptera litura*, the common cutworm. *Biocontrol Science & Technology* 19(9):919-929.
- Anand R & **Tiwary BN** (2009) Th-1 and Th-2 Cytokines in a self-healing primary pulmonary *Aspergillus flavus* infection in Balb/C mice. *CYTOKINE (Springer)* Published online.
- Dubey Jola, **Tiwary BN**, Rathour KS & Ganguli S (2009) Phylogeny of some Indian species/strains of *Steinernema* (Rhabditida) based on RFLPs of the ITS region of rDNA. *International Journal of Nematology* 19: 182-188.
- Kumari N, Kumar P, Mitra D, Prasad B, Tiwary BN & Varshney L (2009) Effects of ionizing radiation on microbial decontamination, phenolic contents and antioxidant properties of Triphala. *Journal of Food Science*. 74(3) doi:10.1111/j.1750-3841.2009.01079.x
- Prakash Dhan, Pandey Janmejy, **Tiwary BN** & Jain Rakesh (2010) Physiological adaptations and tolerance towards higher concentration of selenite (Se⁴⁺) in *Enterobacter sp.* AR-4, *Bacillus sp.*, AR-6 and *Delftia tsuruhatensis*. *Extremophiles (Springer)* Published online DOI 10.1007/s00792-010-0305-8
- Anand Rajesh & **Tiwary BN** (2010) Cytokine profile and cytotoxicity in response to acute intratracheal dose of *Metarhizium anisopliae* in BALB/c mice. *Medical Mycology*, Published online p 1-10.
- Prakash Dhan, Pandey Janmejy, **Tiwary BN** & Jain Rakesh (2010) A process optimization for biocatalytic production of substituted catechol (3-nitrocatechol and 30methylcatechol). *BMC Biotechnology* 10:49-58
- Dubey Jola, Tiwary BN & Ganguly S (2010) Sequencing of ITS rDNA, multiple alignments and phylogeny of a new isolate of entomopathogenic nematode (*Steinernema* sp.) from Bilaspur District, Chhattisgarh. *Indian Journal of Nematology* 40(1):74-82.
- Singh Abha, K Sushma, Prakash Dhan and **Tiwary BN** (2011) Molecular identification of predominant bacteria associated with ‘Khatua’- A traditional fermented food of Bihar, India. *Indian J Microbiology* (communicated online).
- Prakash Dhan, Kumar Ravi, Jain RK & Tiwary BN (2011) Novel pathway for the degradation of 2-

chloro-4-nitrobenzoic acid by *Acinetobacter* sp. Strain RKJ12. Applied & Environmental Microbiology 77:6606-6613.

- Prakash Dhan, Verma Sonika, Bhatia Ranjana & Tiwary BN (2011) Risks and Precautions of Genetically modified organisms. International Scholarly Research Network Ecology:1-13.
- Das Reena & Tiwary BN (2012) Isolation of a novel strain of *Planomicrobium chinense* from diesel contaminated soil of tropical environment. Journal of Basic Microbiology 52:1-10.
- Anand Rajesh, Shankar Jata, Singh Agam P & Tiway BN (2013) Cytokine milieu in renal cavities of immunocompetent mice in response to intravenous challenge of *Aspergillus flavus* leading to aspergillosis. Cytokine 61:63-70.