Dr. Rajesh Kumar (PhD)

Ph.D. (Microbiology and Biotechnology)
CSIR-Indian Institute of Toxicology Research (CSIR-IITR)
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Jhansi, India
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Google scholar ID: https://scholar.google.com/citations?user=OOs_xuEAAAAJ&hl=en

Skills

Microbiological techniques:

Cell culture

Morphological inspections

Staining

MPN Tests

Environmental Monitoring

Biochemical tests

Biofilm formation and detection assay

EPS extraction and estimation

Molecular techniques:

DNA, RNA and Protein isolation

Plasmid extraction

SDS-PAGE and Agarose Gel electrophoresis

PCR and Western blotting

Gene Cloning

cDNA preparation

Profile

I am highly motivated and innovative microbiologist with 6+ laboratory and research experiences particularly in the field of lignocellulosic wastewater/industrial effluent treatment under batch, continuous fed-batch, multipulse fed-batch and DO stat fed-batch strategies, bioremediation, physico-chemical analysis, bacteriological analysis, heavy-metal removal, environmental microbiology and biotechnology area. Also, I have expertise in execution of molecular biology, kraft lignin degradation, Enzyme assay (LiP, MnP, and Laccase) and biochemistry-based research methods. I feel enthusiastic in the laboratory and am passionate about learning new scientific skills. At work I give priority to discipline, teamwork, hard work and time management.

Employment History

Senior Research Fellow, CSIR Indian Institute of Toxicology Research, Lucknow

August 2019 — August 2022

- *Involved in the compatibility test performing of bacteria, nutritional and physiological conditions optimization and enzyme assay, Lignin peroxidase, Manganese peroxidase and Laccase extraction and purification, SEM-EDS, FTIR, GC-MS analysis of bacterial detoxified samples*
- *Involved in the Laboratory adaptation evolution study, consortium based treatment of paper mill effluent, toxicity evaluation: phytotoxicity, genotoxicity and cytotoxicity of effluent, investigation of batch, continuous, multi-pulse and DO stat fed batch treatment strategies under optimized conditions*
- *Authored eleven peer-reviewed journal articles and presented the results of research at international conferences*
- *Supervised seven research trainees in their research activities and provided mentorship to ensure theirsuccessful dissertation completion*

Junior research fellow, CSIR Indian Institute of Toxicology Research, Lucknow

August 2017 — July 2019

- *Involved in the literature search and project proposal writing*
- *Industry visit, sampling and collection of the effluent and isolation, screening and identification of kraft lignin degrading bacterial isolates*
- *Performed biochemical tests effluent quality parameter analysis, kraft lignin estimation, various MSM culture optimization*

Biochemistry:
DNA, RNA, lipid carbohydrate, and protein estimation, Kraft lignin estimation Pentachlorophenol estimation, Antibiotic susceptibility test MIC test, Enzyme assay, Protein extraction and purification

Wastewater analysis:
Sampling, Physicochemical, Biological and Heavy metal analysis

Bioreactor handling
Lab-scale, Pilot-scale, batch, continuous, multi-pulse and DO stat fed-batch

Toxicity evaluation:
Seed germination Phytotoxicity and Genotoxicity assay Chromosomal aberration tests

Animal cell culture handling:
Work on NRK52E-Kidney cell line

Chromatography:
Ion-exchange and Gel-exclusion

Microscopy:
Compound, Fluorescence and Confocal microscopy

Spectrometry:

UV-Vis, AAS, GC-MS

Other techniques:

SEM-EDS, FTIR, FACS

Assistant Professor (Microbiology)

August 13, 2013 - May 17, 2016

College of Pharmacy, SR Group of Institutions (AN ISO 9001: 2008 CERTIFIED INSTITUTE), Approved by A.I.C.T.E. Govt. of India & Ministry of HRD, Managed by Pt. Deendyal Updhyay Shikshan Trust, Jhansi, Uttar Pradesh (0510) -2730090, 6452650, 6532847; Fax:- 0510-2730195

Lectureship in Ozone Classes, LBS- 1st Floor, Topkhana Bazaar Cantonment, Lucknow, Uttar Pradesh (+91) 9956555234

August 2021 — Till now

- *Involved in delivering lectures for NEET, GATE and CSIR-JRF-NET*

Education

PhD, Environmental Toxicology, AcSIR – Academy of Scientific & Innovative Research, India

August 2017 — November 2023

Subject specialization: Environmental Microbiology, Biology and Biochemistry and Biotechnology

M.Sc. Microbiology, Bundelkhand University, Jhansi, India

2010 — 2012

B.Sc. Microbiology, Bundelkhand University, Jhansi, India

2007 — 2010

Internships

M. Sc. Dissertation
February 2012 – June 2013

- *Project Advisor Name: Dr. Savita Lonkar (Quality control manager), in Quality control department, Rupak Enterprises, Indore, 452010, Madhya Pradesh*
- *Topic: Analytical method of Herbal compounds by HPLC.*

Awards and fellowships

CSIR- JRF Fellowship

August 2017 — July 2019

CSIR-SRF Fellowship

August 2019 — August 2022

Computer Skills:

Microsoft Office, GraphPad Prism, ImageJ

Statistical analysis

ANOVA (One-way, Two-way), t-Test, SD, SE

Scientific Skill

Project writing, scientific content writing, Primary data analyses

Other supportive Skill

Leadership skills, Communication skills

Hobbies

Travelling, Reading

Languages

Hindi

English

Publications

1. **Kumar, R.,** Singh, A., Maurya, A., Yadav, P., Yadav, A., Chowdhary, P.,& Raj, A. (2022). Effective bioremediation of pulp and paper mill wastewater using *Bacillus cereus* as a possible kraft lignin-degrading bacterium. *Bioresource Technology*,352, 127076. **(Impact factor: 11.40)**
2. **Kumar, R.,** Maurya[#], A., & Raj, A. (2024). Exploring the potential of bacterial consortium for the treatment of paper mill effluent treatment through various treatment strategies and evaluation of their toxicity. *Journal of Water Process Engineering*, 60, 105135. **(Impact factor: 7.0). (# = First author)**
3. Singh[#], A., **Kumar[#], R.,** Maurya, A., Chowdhary, P., & Raj, A. (2022). Isolation of functional ligninolytic *Bacillus aryabhattai* from paper mill sludge and its lignin degradation potential. *Biotechnology Reports*, *35*, e00755. **(# = First author)**
4. **Kumar, R.,** Maurya, A., & Raj, A. (2023). Emerging technological solutions for the management of paper mill wastewater: Treatment, nutrient recovery and fourth industrial revolution (IR 4.0). *Journal of Water Process Engineering*, 53, 103715.
   (**Impact factor: 7.0)**
5. Maurya, A., **Kumar, R.,** Yadav, P., Singh, A., Yadav, A., Chowdhary, P., & Raj, A. (2022). Biofilm formation and extracellular polymeric substance (EPS) production by *Bacillus haynesii* and influence of hexavalent chromium, *Bioresource Technology*, 352, 127109. (**Impact factor: 11.40)**
6. Maurya, A., **Kumar, R.,** Singh, A., & Raj, A. (2021). Investigation on biofilm formation activity of *Enterococcus faecium* under various physiological conditions and possible application in bioremediation of tannery effluent. *Bioresource Technology*, 339, 125586. (**Impact factor: 11.40)**
7. Maurya, A., **Kumar, R.,** & Raj, A., (2023). Biofilm-based technology for industrial wastewater treatment: current technology, applications and future perspectives. *World Journal of Microbiology and Biotechnology*, 39(5), 112. (**Impact factor: 4.1)**