

# Dr. Shivani Kumari

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**Address:** H. No. 86, Street No. 19, C-block, Khajuri Khas, New Delhi, Delhi – 110094

**Objective:** Looking forward to contributing to science as an assistant professor by teaching and learning through a scientific and analytical approach.

**Current Position:** Assistant Professor (**Ad-hoc**), Department of Zoology, Miranda House, University of Delhi, New Delhi - 110007

From **25.02.2022** to date (**1 year and 2 months**)

## **Work Experience:**

1. Worked as Assistant Professor (Guest Faculty) at the Department of Zoology, Daulat Ram College, University of Delhi, New Delhi - 110007

**From 28.01.2022 to 24.02.2022**

2. working as Assistant Professor, Department of Zoology, Miranda House, University of Delhi, New Delhi – 110007 in the pay scale of academic level 10 on an **ad-hoc basis** as per the details given below:

**From 25.02.2022 to 25.05.2022**

**From 27.05.2022 to date 26.09.2022**

**From 28.09.2022 to 27.01.2023**

**From 30.01.2023 to date**

## **Education:**

**Ph.D. Zoology • Department of Zoology, University of Delhi • September 2022**

**Thesis Title:** Potential application of isolated *Jeotgalicoccus* sp. CR2 for the degradation of Chloramphenicol and remediation of multiple Heavy metals

**M.Sc. Zoology • Kirori Mal College • University of Delhi • May 2016 • (61.5%)**

Subject Specialization: Entomology

**B.Sc. (H) Zoology • Acharya Narendra Dev College • University of Delhi • June 2014 • (71.86%)**

## **National Level Examination:**

**CSIR-UGC NET-JRF • Life Sciences • June 2017 • (50.25%), All India Rank: 68<sup>th</sup>**

## ***Brief About Research:***

**Ph.D. Supervisor:** Prof. Dileep Kumar Singh (Senior Professor), Lab No. 214, Soil Microbial Ecology and Environmental Toxicology Laboratory, Department of Zoology, University of Delhi.

**Research Indices:** Total Impact Factor: 44.40, H-Index: 07, i10 Index: 07, Total Citations: 279

**Research Publications:** 12 (Original Research papers:09; Review papers:03)

## **Salient features of Ph.D. Work:**

- ❖ Heavy metals are increasing water pollution at a rapid pace because of their toxicity. For the removal of these heavy metals, multi-metal ((Ni<sup>2+</sup>, Cu<sup>2+</sup>, Zn<sup>2+</sup>, and Pb<sup>2+</sup>) resistant bacterial strain CR2 was isolated from the Yamuna River water.
- ❖ Biochemical and phylogenetic characterization using 16s rRNA depicted that the isolated multi-metal resistant bacterial strain CR2 was belonging to the genus *Jeotgalicoccus*.
- ❖ The metal removal efficiency at 36 h was recorded at a 20 ppm concentration of each heavy metal. The highest metal removal (%) was recorded for Cu<sup>2+</sup> (96.65%) followed by Zn<sup>2+</sup> (94.4%), Pb<sup>2+</sup> (69.4%), and lowest for Ni<sup>2+</sup> (65%).
- ❖ For studying the changes in the bacterial cell during biosorption of these metals, Scanning Electron Microscopy (SEM) was used to depict evident changes in the bacterial cell shape and size while Fourier Transform Infrared Spectroscopy (FTIR), was used to determine the corresponding functional groups which interact with the heavy metals present on the bacterial surface.

**Research Publications: 12 (Original Research papers:09; Review papers:03)**

**Total Impact Factor: 44.40, H-Index: 07, i10 Index: 07, Total Citations: 279**

- 1. Kumari, S., Amit., & Singh, D. K. (2023).** Swift and precise detection of argemone oil adulteration in virgin coconut oil by implementing ATR-FTIR spectroscopy integrated with multivariate chemometrics and regression modelling. *Vibrational Spectroscopy*, 103525.  
Impact factor: **2.38**, Cite Score: **3.8**
- 2. Amit., Kumari, S., & Jamwal, R. (2023).** Use of FTIR spectroscopy integrated with multivariate chemometrics as a swift, and non-destructive technique to detect various adulterants in virgin coconut oil: A comprehensive review. *Food Chemistry Advances*, 100203.
- 3. Kumari, S., Amit., & Jamwal, R. (2022).** Isolation and identification of *Jeotgalicoccus* sp. CR2 and evaluation of its resistance towards heavy metals. *Cleaner Waste Systems*, 3, 100062.
- 4. Kumari, S., Amit, Jamwal, R., Mishra, N., & Singh, D. K. (2020).** Recent developments in environmental mercury bioremediation and its toxicity: a review. *Environmental Nanotechnology, Monitoring & Management*, 13, 100283.  
Impact factor: **5.64**, Citations: **85**
- 5. Amit., Jamwal, R., Kumari, S., Kelly, S., Cannavan, A., & Singh, D. K. (2022).** Assessment of geographical origin of virgin coconut oil using inductively coupled plasma mass spectrometry along with multivariate chemometrics. *Current Research in Food Science*.  
Impact factor: **6.26**, Cite Score: **2.8**
- 6. Amit, Jamwal, R., Kumari, S., Dhaulaniya, A. S., Balan, B., & Singh, D. K. (2020).** Application of ATR-FTIR spectroscopy along with regression modelling for the detection of adulteration of virgin coconut oil with paraffin oil. *LWT*, 118, 108754.  
Impact factor: **6.05**, Cite Score: **7.0**, Citations: **42**

7. Amit, Jamwal, R., **Kumari, S.**, Kelly, S., Cannavan, A., & Singh, D.K. (2020). Rapid detection of pure coconut oil adulteration with fried coconut oil using ATR-FTIR spectroscopy coupled with multivariate regression modelling. *LWT*, 125, 109250.  
Impact factor: **6.05**, Cite Score: **7.0**, Citations: **21**
8. Amit, Jamwal, R., **Kumari, S.**, Dhaulaniya, A. S., Balan, B., Kelly, S., Cannavan, A., & Singh, D. K. (2020). Utilizing ATR-FTIR spectroscopy combined with multivariate chemometric modelling for the swift detection of mustard oil adulteration in virgin coconut oil. *Vibrational Spectroscopy*, 109, 103066.  
Impact factor: **2.38**, Cite Score: **3.8**, Citations: **24**
9. Jamwal, R., Amit, **Kumari, S.**, Balan, B., Dhaulaniya, A. S., Kelly, S., Cannavan, A., & Singh, D. K. (2020). Attenuated Total Reflectance–Fourier transform infrared (ATR– FTIR) spectroscopy coupled with chemometrics for rapid detection of argemone oil adulteration in mustard oil. *LWT*, 120, 108945.  
Impact factor: **6.05**, Cite Score: **7.0**, Citations: **35**
10. Jamwal, R., Amit, **Kumari, S.**, Balan, B., Kelly, S., Cannavan, A., & Singh, D. K. (2021). Rapid and non-destructive approach for the detection of fried mustard oil adulteration in pure mustard oil via ATR-FTIR spectroscopy-chemometrics. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 244, 118822.  
Impact factor: **4.83**, Cite Score: **7.1**, Citations: **26**
11. Jamwal, R., Amit, **Kumari, S.**, Sharma, S., Kelly, S., Cannavan, A., & Singh, D. K. (2021). Recent trends in the use of FTIR spectroscopy integrated with chemometrics for the detection of edible oil adulteration. *Vibrational Spectroscopy*, 103222.  
Impact factor: **2.38**, Cite Score: **3.8**, Citations: **39**
12. Jamwal, R., Amit, **Kumari, S.**, Kelly, S., Cannavan, A., & Singh, D.K. (2021). Non-targeted fingerprinting approach for rapid quantification of mustard oil adulteration with linseed oil: an economically motivated adulteration. *Vibrational Spectroscopy*, 103226.  
Impact factor: **2.38**, Cite Score: **3.8**, Citations: **04**

### ***Research Publications under communication:***

1. Amit, **Kumari S.**, Jamwal R., Singh, D.K. (2023) Implementation of ATR-FTIR spectroscopy integrated with multivariate chemometrics as an expeditious, and non-calamitous technique for the quantification of palm oil adulteration in virgin coconut oil  
*Food Chemistry Advances, (3<sup>rd</sup> Revision)*

### ***College-Corporate Life Contribution:***

#### **1. Member**, Unnat Bharat Abhiyan (UBA), Miranda House

1.1 Visit to Jagatpur Village for Nukkad Natak for “Swachta Abhiyan.”

1.2 Mentored students for script writing for upcoming Nukkad Natak Programs

1.3 Participated in UB Mahotsav and Expo “Unnati” Programme held at IIT Delhi, held on 17<sup>th</sup> March 2023

**2. Resource Person**, BRIDGE COURSE on LABORATORY INSTRUMENTATION: PRINCIPLE, USAGE, AND APPLICATIONS held from 23<sup>rd</sup> – 27<sup>th</sup> January 2023, organized at Department of Zoology, Miranda House, University of Delhi

#### **3. NAAC Contribution**

3.1 Updating the departmental Annual Records during the NAAC visit

3.2 Updating departmental display boards

3.3 Designed format of the official NAAC team visit route map

3.4 Contributed to Life Sciences NAAC presentations and brochures

**4. NEP admissions** for the academic session 2022-23, Miranda House

**5. Mentor**, D.S. Kothari Summer Internship Program, DSKC, Miranda House, July 2022 on the topic ‘Detection of Heavy metal load in Yamuna River water.’

**6. Resource Person**, BRIDGE COURSE on LABORATORY INSTRUMENTATION: PRINCIPLE, USAGE, AND APPLICATIONS held from 4<sup>th</sup> – 8<sup>th</sup> July 2022, organized at Department of Zoology, Miranda House, University of Delhi

**7. Organizing Member**, two-day Interdisciplinary “Capacity Building Workshop” for Laboratory staff from 20 - 21 December 2022, Miranda House

### ***Research Project:***

**Project Title:** Bioremediation of chemical contaminants and their complexes present in drainage wastewater with high dynamic flux used for irrigation in urban and peri-urban agriculture. (NASF/CA-6030/2017-18)

The isolated heavy metal and chloramphenicol antibiotic-resistant bacteria *Jeotgalicoccus* sp. CR2 (MZ416738) has been submitted to ICAR - National Agricultural Science Fund (NASF) to be used in the Activated sludge technology-based bioreactor at IARI, New Delhi, for decontamination of wastewater for agriculture usage.

### ***Academic Participation***

Assisted M.Sc. final-year students in their dissertation work. (2017 – 2020)

Assisted in conducting practical classes of the M.Sc. final year [Subject - Insect toxicology] (2017-2019)

### ***Techniques, Software & Skills:***

#### ***Tools and Techniques***

Liquid Chromatography-Mass Spectrometry (LCMS)

Ultra-Performance Liquid Chromatography (UPLC)

Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR) Spectroscopy

Inductively coupled plasma mass spectrometry (ICP-MS)

Atomic Absorption Spectroscopy (AAS)

Scanning Electron Microscopy (SEM)

Thin Layer Chromatography (TLC)

Autoclave

#### ***Subjects taught:***

Human Physiology,

Developmental Biology

#### ***Languages:***

English, Hindi

### ***Conferences and Workshops Participated:***

1. Participated in a workshop on the Implementation of NEP 2020: Implications for Undergraduate Colleges, held on 23<sup>rd</sup> September 2022 in Miranda House, University of Delhi.
2. Participated in International Colloquium on ‘Regulatory Mechanisms Underlying Behavior, Physiology and Development (RMBPD 2021), organized by the Department of Zoology, University of Delhi.
3. Poster presentation in 2nd International Conference on Recent Advances in Agricultural, Environmental & Applied Sciences for Global Development (RAAEASGD), (2019) at Dr. YSPUHF Solan, Himachal Pradesh, India on “Isolation of potential MRB from PTPS dumpsite”.
4. Poster presentation at International Conference Contemporary Issues in Integrating Health and Nutrition with the Emerging Areas of Food Technology, Agriculture, Environment and Allied Sciences, (2019) at Shyama Prasad Mukherji College for Women, University of Delhi, New Delhi, India on “ATR-FTIR spectroscopy along with multivariate chemometrics for the classification and detection of palm oil adulteration in extra virgin olive oil”.
5. Poster presentation at 58th Annual Conference of Association of Microbiologists of India (AMI-2017) & International Symposium on “Microbes for Sustainable Development: Scope & Applications” (MSDSA-2017): on “Isolation of Potential Aerobic Denitrifying Bacteria from Yamuna River Water”.
6. Participated in National Workshop and presented a poster on “Innovative Green Technique use for Safe Portable Water in Villages” organized by Zakir Hussain Delhi College, University of Delhi, 10-11 Jan 2013.
7. Participated in Oral Presentation at three days National conference on “Redefining Science Teaching: Future of Education” Organized by Acharya Narendra Dev College, University of Delhi, 7-9 Mar 2013.
8. Participated in two days of hands-on training on “Molecular Phylogenetics: Understanding Evolutionary Histories” Organized by Acharya Narendra Dev College, University of Delhi, 15-16 Aug 2012.

**Place: New Delhi**

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