Dr. (Mrs) Atya Kapley

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Key Professional Awards and Memberships

- Young Scientist Award in the field of environmental microbiology, presented by the 'Association of Microbiologists of India' for the year 2000, 41st Annual Meeting of AMI, Microbiotech 2000, Nov 25-27, 2000
- Woman Scientist Award presented by the Biotech Research Society of India for the year 2008, at Banaras Hindu University, Nov 2009
- **CSIR-Technology Awards 2020, for Restoration of Nallahs with Ecological Units (RENEU) Technology (Team Award)**
- Fellow of "Maharashtra Academy of Sciences" (Membership No JLF 900)
- Vice President OWSD, Asia-Pacific Region (Organization for Women in Science in the Developing World) an international organization founded in 1987 and based at the offices of The World Academy of Sciences (TWAS), in Trieste, Italy. It is a program unit of UNESCO

- **Affiliation to various professional groups**
  - Life Member: Association of Microbiologists of India
  - Life Member: Society of Biological Chemists of India
  - Life Member: Biotech Research Society of India

Assistant Editor: Applied Biochemistry and Biotechnology, Springer publication
Guest Editor: Frontiers in Microbiology

Member of Committees

- Task Force Member, Environmental Biotechnology, in the Department of Biotechnology, Ministry of Science and Technology, New Deli, Govt. of India (2018-2019)
- Member of Subject Expert Committee (SEC) under ALL India Coordinated Project on Capacity Building in Taxonomy. MOEF&CC (2019-2022)
- DBT-NER Scientific and Technical Appraisal and Advisory Group (STAG) in the Area of Energy, Environment and Bioresource Based Applications for the North East Region (Dec 2018 –Dec 2021)

- NER-Twinning R&D Program in the Area of Environmental Biotechnology, DBT, 2018-2021
- Screening committee for scientific and technical staff at the Institute (CSIR-NEERI, Nagpur, India)
- Selection committee for scientific and project staff at the Institute (CSIR-NEERI, Nagpur, India)
- Nagar Vikas Anubhag committee for waste management, Lucknow
- 7th EC Project Appraisal Meeting, CPCP 16-07-2020
- Promotions of Innovations in Individuals, Start Ups and MSMEs (PRISM) Advisory and Screening Committee, DSIR, 2020-2025

Key achievements

- Taking lab-scale work into field; In-situ drain treatment of 6 drains at Prayag Raj, 10 drains and Gorakhpur (ongoing). **RENEU Technology licensed for Rs 2 crore** (Team Leader)
- Using Omics tools to link diverse xenobiotics to functional and taxonomical components of microbial diversity of target polluted niches
- Developed expertise of analyzing environmental compliance of waste treatment operations, thereby dealing with diverse chemicals that are toxic to the ecosystem
- Established protocols to study sub-lethal toxicity due to cholorophenols and mitochondrial toxicity due to herbicide exposure
- Metagenome analysis of the resistome of activated biomass
- Mapping new emerging health concerns targeting multi-drug resistant genes in environmental niche
- Lake rejuvenation projects: at Bareilly, U.P and Nagpur (Team Leader)
- Bioremediation of crude oil contaminated ONGC sites at Gandhar, Gujarat and Lakwa, Assam; Project coordinator for a network project with nine institutes
- Development of Waste Management System at NEERI i.e. composting of colony waste (Team Leader)
- Preparation of the Environmental Status Report of Nagpur for Nagpur Municipal Corporation (Team Leader)
- Development of a Waste Management Park at CSIR-NEERI (project Leader)
- Established collaborations nationally and internationally
- Working in the area of gender parity and empowerment of women in science via the Organization for Women in Science for the Developing World, (OWSD) A program unit of UNESCO
- Launched an outreach program, JAGRUTI: EK SAMAJ EK LAKSHYA for taking science to society
- Working with NGOs for public outreach

Current Areas of Research:

Research is focused on monitoring environmental pollutants, studying their impact on the ecosystem and developing solutions for remediation of contaminated niches. A multi-disciplinary approach is used by combining conventional microbiology tools with engineering, molecular tools and bioinformatics to address rising levels of environmental contamination. Omics tools are used to study microbial diversity in environmental niches and analytical tools are used to study diverse chemicals from different polluted niches. Biological toxicants are monitored as multi-drug resistant genes as well as secondary metabolite producing bacteria. Effect of pesticides on signaling pathways are studied to explore toxicity of xenobiotics.

List of Papers Accepted in National and International Journals:

- Papers accepted in national / international journals and Editor/ Author -Chapters in Books: **Annexure I**

Positions Held

▪ Scientist Gp. IV(5)	NEERI	Jan 2014 to date
▪ Scientist Gp. IV(4)	NEERI	Jan 2009 to Dec 2013

- Scientist Gp. IV(3) NEERI Jan 2005 to Dec 2008
- Scientist Gp. IV(2) NEERI 2001 to 2005
- Scientist Gp. IV(1) NEERI 1996 to 2001
- Scientist Fellow NEERI Dec `95 - Oct `96
- Research Associate NEERI Mar `94 - Dec `95
- Senior Project Fellow NEERI Nov `92 – March `94

Education

- **B.Sc**. 1986, Osmania University, Hyderabad Ist Class in Botany, Zoology, Chemistry
- **M.Sc.** 1988, University of Roorkee, Roorkee Ist Class in Biosciences and Biotechnology
- **Ph.D.** 1992, School of Life Sciences, University of Hyderabad, Hyderabad **Title :** Endogenous factors regulate the DNA binding of the receptor estrogen complex in rat and goat uteri.

Pressent Position

Scientist Gp IV(5) **Senior Principal Scientist &Head, Director's Research Cell, CSIR- NEERI**,

Nehru Marg Nagpur - 440 020, INDIA

Completed Projects:

#	Project Title	Sponsor	Period	Fund*(Rs. In lakhs)*
1.	Exploration and exploitation of microbial wealth of India	CSIR	Jan 2002 -Dec 2007	257.70
2.	Development of Simulation Model for Biodegradation of Mixed Waste Stream for Pesticides	DBT	Feb 2004- March 2007	13.95
3.	Assessment of Microbial Diversity of CETP	M/s JETL, Hyderabad (Jeedimetla Effluent Treatment Ltd.)	Jan 2005 -Dec 2006	14.50
4.	Study on catabolic assimilatory capacity and population dynamics of hydrocarbon remediating effluent treatment plant	DBT	May 2000 – April 2003	19.95

5.	Development of Biosensor and microbial tracking tools for nitrophenolic wastewaters	DBT	Oct 2000 – Sept 2003	21.51
6.	Development of user-friendly water analysis protocol based on genetic determinants	DBT	Oct 2000 – Sept 2003	23.49
7.	Indo- Finland Collaborative project: Genomic tools in bioremediation: A case study with atrazine as pollutant	DBT	October 2008 to Jan. 2012	65.94
8.	Mining the metagenome of activated biomass for new antibiotic molecules	DBT	April 2008-March 2012	40.73
9.	Bioremediation of contaminated site using Genomics tool	CSIR	April 2007-March 2012	153.00
10.	Stress Response in Bacteria: Role of salt and dissolved oxygen levels	CSIR	April 2007-March 2012	78.00
11.	Screening for Bio-molecules from microbial diversity collected from different ecological niches	DBT	Dec 2007- March 2014	179.76
12.	Wastewater Reuse: Improving the Odds by understanding Natural Attenuation (WRANA)	EU project Indian funding by DBT Collaboratots from Univ of Minho, Portugal and Univ of Tartu, Estonia	Inno-Indigo Policy (EU-DBT) Nov 2015 to Nov 2018	63.564
13.	Genomic and Biochemical Characterization of Bacterial Isolates Degrading Atrazine and its Application in Herbicide Bioremediation	DBT New Delhi	Jan 2015 to Jan 2018	66.75
14.	Centre of Excellence for Molecular Environmental Science and Engineering Research	CSIR Network project	April 2012-March 2017	200.00

CSIR: Council of Scientific and Industrial Research, New Delhi

DBT: Department of Biotechnology, Ministry for Science & Technology, Govt. India, New Delhi

Ongoing Projects

#	Project Title	Sponsor	Period	*Fund (*Rs. In lakhs)
1.	Assessment of Contribution of Stubble Burning in Haryana and Punjab States on Air Quality in Delhi	Central Pollution Control Board (CPCB), Delhi	2017-2019	51.63
2.	Predicting functionality of domestic wastewater treatment plants when challenged by xenobiotics, anti-bacterials and surfactants (XAS)	DBT, New Delhi	2018-2020	59.23
3.	Environmental Status Report 2016-2021 for Nagpur City.	Nagpur Municipal Corporation	2017-2021	120
4.	Estimation of Ecosystem Services and Environmental Damage Cost Due to Climate Change: Biodiversity Perspective	CSIR	2018-2020	305
5.	Enhanced Natural Attenuation for In-situ Nallah Treatment	NMCG/State Mission for Clean Ganga, Uttar Pradesh	2019-2021	10.90 crore
6.	Engineered Bioremediation Approaches for Onsite Treatment of Soil Contaminated with Crude Oil	DBT, New Delhi Network project	2019-2022	8.5 crore
7.	In-situ treatment of drains in Gorakhpur city using CSIR-NEERI's RENEU Technology	UP Jal Nigham	2020-2022	6.4 crore
8.	Bio-Mimetic and Phyto-Technologies Designed for Low-Cost Purification and Recycling of Water.	H2020 project EU-India partners	2019-2024	186
9.	Conservation , Beautification and Treatment of Niwari Ponds,Gaziabad UPC	Niwari Nagar Nigham	Feb 2020 to Feb 2023	6.6 crore
10	Bioremediation of Sanjay Community Pond, Bareilly	Bareilly Smart City	2020-2021	190

11	Jagruti Programme : Ek Samaj Ek Lakshya	CSIR	2019-2022	100
12	GIS-based Mapping of Microbial Diversity across the Ganges for Ecosystem Services	NMCG Network project	2019-2022	9.13 crores

List of patents filed/ granted

1. H.J. Purohit, A Kapley, D.V. Raje, S. Devotta
   User friendly detection of E-Coli on indicator bacterium for drinking water quality
   Provisional US Patent Filed Patent application No. 0367NF2004

2. H.J. Purohit, A Kapley, D.V. Raje, S. Devotta
   RAPD kit for genetic fingerprinting of bacteria isolates
   Provisional US Patent Filed Patent application No. 0001NF2005

3. H.J. Purohit, A Kapley, D.V. Raje, S. Devotta
   A method for the screening of bacterial isolates Available Online: No. WO/2007/105041

Annexure I

Papers published

108. Lakkireddy, S., Aula, S., Kapley, A., Gundeti, S., Kutala, V.K. and Jamil, K., 2021. Association of DNA repair gene XPC Ala499Val (rs2228000 C> T) and Lys939Gln (rs2228001 A> C) polymorphisms with the risk of Chronic Myeloid Leukemia: A case-control study in South Indian Population. *The Journal of Gene Medicine*, p.e3339.

107. Jhariya, U., Dafale, N.A., Srivastava, S., Bhende, R.S., Kapley, A. and Purohit, H.J., 2021. Understanding Ethanol Tolerance Mechanism in Saccharomyces cerevisiae to Enhance the Bioethanol Production: Current and Future Prospects. *BioEnergy Research*, pp.1-19.

106. Yadav, S. and Kapley, A., 2021. Antibiotic resistance: Global health crisis and metagenomics. *Biotechnology Reports*, p.e00604.

105. Andraskar, J., Yadav, S. and Kapley, A., 2021. Challenges and Control Strategies of Odor Emission from Composting Operation. *Applied Biochemistry and Biotechnology*, pp.1-26.

104. Bherwani, H., Nair, M., Kapley, A. and Kumar, R., 2020. Valuation of Ecosystem Services and Environmental Damages: An Imperative Tool for Decision Making and Sustainability. European Journal of Sustainable Development Research, 4(4). https://doi.org/10.29333/ejosdr/8321

103. Memon, H., Lanjewar, K., Dafale, N. *et al.* Immobilization of Microbial Consortia on Natural Matrix for Bioremediation of Wastewaters. *Int J Environ Res* 14, 403–413 (2020). https://doi.org/10.1007/s41742-020-00267-0

102. Kumar, R., Pujari, P., Chauhan, P., Agarwal, S., Jain, S., Jain, S., Elango, L., Muduli, P., Padmakar, C., Deshpande, L. and Kapley, A., 2020, March. Environmental Science and Remote Sensing Applications in Hydrological Studies. In Proc Indian Natn Sci Acad Vol. 86, No. 1, pp. 495-501

101. Bherwani, H., Nair, M., Musugu, K., Gautam, S., Gupta, A., Kapley, A. and Kumar, R., 2020. Valuation of air pollution externalities: comparative assessment of economic damage and emission reduction under COVID-19 lockdown. Air Quality, Atmosphere & Health, pp.1-12. https://doi.org/10.1007/s11869-020-00845-3

100. Yadav, T.C., Jadeja, N.B. & Kapley, A. Metagenomic Insights in Activated Biomass Treating Industrial Wastewater at Different DO Levels. Appl Biochem Biotechnol 192, 544–556(2020). https://doi.org/10.1007/s12010-020-03340

99. Bhardwaj, P., Singh, K.R., Jadeja, N.B., Phale, P.S. and Kapley, A., 2020. Atrazine Bioremediation and Its Influence on Soil Microbial Diversity by Metagenomics Analysis. *Indian Journal of Microbiology*, pp.1-4. Doi 10.1007/s12088-020-00877-4

98. Viggor, S., Jõesaar, M., Soares-Castro, P., Ilmjärv, T., Santos, P.M., Kapley, A. and Kivisaar, M.,2020. Microbial Metabolic Potential of Phenol Degradation in Wastewater Treatment Plant of Crude Oil Refinery: Analysis of Metagenomes and Characterization of Isolates. *Microorganisms*, *8*(5), p.652 doi: 10.3390/microorganisms8050652.

97. Yadav, S. and Kapley, A., 2019. Exploration of activated sludge resistome using metagenomics. *Science of The Total Environment*, *692*, pp.1155-1164. doi: 10.1016/j.scitotenv.2019.07.267.

96. Soares-Castro, P., Yadav, T.C., Viggor, S., Kivisaar, M., Kapley, A. and Santos, P.M., 2019. Seasonal bacterial community dynamics in a crude oil refinery wastewater treatment plant. Applied Microbiology and Biotechnology, 103(21-22), pp.9131-9141

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94. Sahu, N., Sharma, G., Chandrashekhar, B., Jadeja, N.B., Kapley, A., Pandey, R.A. and Sharma, A., 2019. Performance evaluation of methanogenic digester using kitchen waste for validation of optimized hydrolysis conditions for reduction in ammonia accumulation. Renewable Energy. 139, pp 110-119 doi: https://doi.org/10.1016/j.renene.2019.02.023

93. Kulkarni, A., Kapley, A., Dhodapkar,R.S., Nagababu, P., and Rayalu S. 2019. Plasmonics driven engineered pasteurizers for solar water disinfection (SWADIS). Journal of Hazardous Materials 369 pp 474-482. https://doi.org/10.1016 /j.jhazmat.2019.02.052.

92. Jadeja, N.B., Moharir, P. and Kapley, A., 2019. Genome sequencing and analysis of strains Bacillus sp. AKBS9 and Acinetobacter sp. AKBS16 for biosurfactant production and bioremediation. Applied biochemistry and biotechnology, 187(2), pp.518-530. https://doi.org/10.1007/s12010-018-2828-x

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88. Ashwinkumar P.R, Jadeja N.B., Gandhi, D., Juwarkar, A.A., Sharma, A., Kapley, A., and Pandey, R. A. 2017. Microbial population shift caused by sulfamethoxazole in engineered-Soil Aquifer Treatment (e-SAT) system. World Journal of Microbiology and Biotechnology 33(6) 121. doi: 10.1007/s11274-017-2284-8

87. Sahu, N., Deshmukh, S., Chandrashekhar, B., Sharma, G., Kapley, A., and Pandey R. A. 2017. Optimization of hydrolysis conditions for minimizing ammonia accumulation in two-stage biogas production process using kitchen waste for sustainable process

development. Journal of Environmental Chemical Engineering. 5(3), 2378-87. Doi:https://doi.org/10.1016/j.jece.2017.04.045

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75. Lakkireddy, S., Aula, S., Swamy, A.V.N., Kapley, A., Digumarti, R.R. and Jamil, K., 2015. Association of the common CYP1A1* 2C variant (Ile462Val polymorphism) with chronic myeloid leukemia (CML) in patients undergoing imatinib therapy. Cell Journal *(Yakhteh)*, *17*(3), p.510. doi: 10.22074/cellj.2015.11

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69. Sagarkar, S., Nousiainen, A., Shaligram, S., Björklöf, K., Lindström, K., Jørgensen, K.S. and Kapley, A., 2014. Soil mesocosm studies on atrazine bioremediation. Journal of Environmental Management, *139*, pp.208-216. doi: 10.1016/j.jenvman.2014.02.016.

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