



Dr. PRAVEENA GANGADHARAN
Assistant Professor,
Department of Civil Engineering,
Environmental Sciences and Sustainable Engineering
Center (ESSENCE)
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1. Education Qualification

- Ph.D., Environmental Engineering, Indian Institute of Technology Madras, India (2017).
- M.Tech., Environmental Engineering, College of Engineering, Trivandrum, Kerala University, India (2008).
- B.Tech., Civil Engineering, College of Engineering, Trivandrum, Kerala University, India (2006).

2. Professional Experience

- 2018- Till date: *Assistant Professor*, Civil Engg., IIT Palakkad, India
- 2017- 2018: *Associate Professor*, A. P. J. Abdul Kalam Technical University, India
- 2014-2017: *Women Scientist (Sponsored by Department of Science and Technology)*, Indian Institute of Technology Madras, India
- 2008-2012, *Assistant Professor*, M. G. University, Kerala, India

3. Teaching and Research Interests

Sanitation; Bioelectrochemical systems for wastewater treatment; Resource Recovery from urine; Desalination; Defluoridation; Metal reduction and recovery

4. Teaching Profile

1. Undergraduate courses

- Hazardous Waste Management
- Environmental Engineering
- Ecology and Environment
- Environmental and Hydraulics Laboratory

b. Postgraduate courses

- Solid Waste Management
- Biological Process Design for Wastewater Treatment
- Physico-Chemical Water Treatment Processes

5. Research Group

- Reiva Sibi (Ph.D. Scholar) 2018 - Present
- Sabarija A M (Ph.D. Scholar) 2019 - Present

- B Padmavathy (MS Sholar) 2022 – Present
- Dr. Gunaseelan (Project scientist) 2022 - 2023
- Monish raj (Project Associate) 2021 - Present
- Sangeetha V (Research Associate) 2022 - Present
- Dr. Anju Elizbath Peter (Postdoctoral Fellow) 2021-2022

6. Current Sponsored Projects:

1. Title: Global Sanitation Centre of Excellence, IIT Palakkad; Role: Project Director; Funding Agency: CSR-HDFC, India; Duration: 2022-2024; Approved Budget: Rs. 20,00,0000/-.
2. Title: Global Sanitation Centre of Excellence, IIT Palakkad; Role: Project Director; Funding Agency: BMGF; Duration: 2022-2027; Approved Budget: Rs. \$2,528,937.
3. Title: Production of biofertilizers from source-separated urine; Role: Co-PI; Funding Agency: DST, India; Duration: 2022-2024; Total amount = Rs. 89,23,790/- (108331 \$).

7. Completed Projects:

1. Title: Real-Time Air Quality and Weather Monitoring System for IIT Palakkad Campus; Role: PI; Total amount = Rs. 1,45,96,658/- (177197 \$) (Institute Internal Project)
2. Title: Energy positive microbial osmotic-electro desalination cell for wastewater treatment and high-quality water recovery; Role : PI; Funding Agency: SERB, India; Duration: 2019-2022; Total amount = Rs.3995000/- (48497 \$) .
3. Title: Integrating wastewater treatment to groundwater softening and defluoridation using microbial desalination cell; Role : PI; Funding Agency: SERB, India; Duration: 2019-2022; Total amount = Rs.3520000/- (42731 \$).
4. Title: Wastewater treatment coupled with resource recovery and energy production using microbial fuel cell; Role : PI; Funding Agency: DST-WoSA, India; Duration: 2014-2017; Total amount = Rs.2095000/- (25432 \$).
5. Title: CLEANEXT-Energy positive treatment technology for the Removal/Recovery of hexavalent chromium; Role: Mentor; Funding Agency: Carbon Zero Challenge, IIT Madras and IWMA with support from U.S. Consulate General; Duration: 2017-2018; Total amount = Rs.500000/- (6069.81 \$).

8. Publications.

1. Sangeetha, V., Kuppurangan, G., & **Gangadharan, P.** (2023). Stale urine catalysed resource recovery from source separated urine using magnesium air fuel cell: Insights into the mechanism, its implications and challenges. *Separation and Purification Technology*, 125295. **(IF: 8.6)**
2. Vaishag, P. V., Mohandas, S. A., Mufeeda, M., **Gangadharan, P.**, & Rasheed, P. A. (2023). Conversion of Electronic Waste to an Electrochemical Sensor for Dopamine:

- Using MXene-Modified Liquid Crystal Display Panels. *ACS Sustainable Chemistry & Engineering*, 11(34), 12771-12779. **(IF: 8.4)**
3. Sibi, R., Sheelam, A., Gunaseelan, K., Jadhav, D. A., & **Gangadharan, P.** (2023). Osmotic microbial fuel cell for sustainable wastewater treatment along with desalination, bio-energy and resource recovery: A critical review. *Bioresource Technology Reports*, 101540. **(Cite Score: 7.8)**
 4. Mohandas, S. A., Janardhanan, S., Rasheed, P. A., & **Gangadharan, P.** (2023). Improved defluoridation and energy production using dimethyl sulfoxide modified carbon cloth as bioanode in microbial desalination cell. *Heliyon*. **(IF: 4.0)**
 5. Peter, A. E., Raj, M., **Gangadharan, P.**, P, A., & Nagendra, S. S. (2023). Trends, Extreme Events and Long-term Health Impacts of Particulate Matter in a Southern Indian Industrial Area. *Water, Air, & Soil Pollution*, 234(5), 303. **(IF: 2.9)**
 6. Rajumon, R., **Gangadharan, P.**, & Mohandas, S. A. (2023). Osmotic Microbial Fuel Cell for Groundwater Softening, Defluoridation, Salinity Reduction, and Energy Production. *Journal of Environmental Engineering*, 149(2), 04022094. **(IF: 2.2)**
 7. Shabana, N., Arjun, A. M., Ankitha, M., Mohandas, S. A., **Gangadharan, P.**, & Rasheed, P. A. (2023). A flexible and sensitive electrochemical sensing platform based on dimethyl sulfoxide modified carbon cloth: towards the detection of dopamine and carvedilol. *Analytical Methods*, 15(5), 685-692. **(IF: 3.532)**
 8. **Gangadharan, P.**, Rajumon, R., Sibi, R., & Peter, A. E. (2022). Osmotic urine fuel cell to recover water, energy, and nutrients along with salinity reduction. *Journal of Applied Electrochemistry*, 1-10. **(IF: 2.925)**
 9. **Gangadharan, P.**, Anitha, V., Sibi, R., Sheelam, A. Concentrating nutrients and recovering water and energy from source separated urine using osmotic microbial fuel cell. *Chemosphere*. **(IF: 8.9)**
 10. **Gangadharan, P.**, & Nambi, I. M. 2020. The performance of Cu²⁺ as dissolved cathodic electron-shuttle mediator for Cr⁶⁺ reduction in the microbial fuel cell. *Sustainable Environment Research*, 30 (19) **(IF: 6.7)**
 11. **Gangadharan, P.**, & Nambi, I. M. 2017 Feasibility Study of Disposed LCD Monitor and Carbon Cloth Electrodes for Synchronized Removal/Recovery of Cr⁶⁺ by Microbial Fuel Cells. *International Journal of Environmental Science and Development*, 8(8), 557-560
 12. **Gangadharan, P.**, Nambi, I. M., Senthilnathan, J. & Pavithra V.M. 2016 Heterocyclic aminopyrazine-reduced graphene oxide coated carbon cloth electrode as an active bio-electrocatalyst for extracellular electron transfer in microbial fuel cells. *RSC Adv.*, 6, 68827-68834 **(IF: 4.036)**
 13. **Gangadharan, P.**, Nambi, I. M., & Senthilnathan, J. 2015 Liquid crystal polaroid glass electrode from e-waste for synchronized removal/recovery of Cr⁶⁺ from wastewater by microbial fuel cell. *Bioresource technology*, 195, 96-101 **(IF: 11.889)**

14. **Gangadharan, P.**, & Nambi, I. M. 2015 Hexavalent chromium reduction and energy recovery by using dual-chambered microbial fuel cell. *Water Science and Technology*, 71(3), 353-358 (IF: 2.4).

9. Book Chapter

1. Khan, M. J., Suryavanshi, V. J., Joshi, K. B., **Gangadharan, P.**, & Vinayak, V. (2022). Photosynthetic microalgal microbial fuel cells and its future upscaling aspects. In *Handbook of Algal Biofuels* (pp. 363-384). Elsevier.
2. Padmavathy and **Praveena Gangadharan**, E-waste-derived materials for resource recovery and wastewater treatment applications, in *Emerging Trends and Advances in Microbial Electrochemical Technologies*. Elsevier publications. (With the editor)

10. International conferences:

1. Reiva Sibi, Praveena Gangadharan*, Bioelectricity generation and fertilizer production coupled with water recovery from source-separated urine using a bio-osmotic resource recovery unit", at SPARC funded INDO-US two-day workshop on "Circular solutions to sanitation - Making profits from toilets" conducted by TAURI (Translating and Accelerating University Research and Innovation) research group, in IIT Madras on 29th and 30th March, 2023.
2. Sangeetha, V., Kuppurangan, G., Gangadharan, P*. "A comparative study on biofertilizer and green energy production from source separated urine with magnesium air fuel cell - membrane and membrane less system" in the two-day SPARC funded Indo-US workshop on "Circular solutions to sanitation - Making profits from toilets" held at Indian Institute of Technology Madras on 29 & 30, March 2023.
3. Reiva Sibi, Praveena Gangadharan*, "Electrochemical phosphorous recovery from source separated urine using stale urine as a catalyst", at the DST-SERB Sponsored National Conference on Bioenergy & bio-products from Agro-industrial sector and its associated Circular Economy (BACE-2023) 10th and 11th March, 2023, Pondicherry University.
4. Sangeetha Vivekanandhan, Gunaseelan Kuppurangan, Praveena Gangadharan*, "Production of biofertilizer and energy from source separated urine using electrochemical phosphate recovery reactor," Symposium on India's journey to net zero emissions, 21st of January, 2023, IIT Palakkad.
5. Sabarija A M, Praveena Gangadharan, The performance of disposed LCD screen as anode in microbial desalination cell for groundwater softening," Research scholars day 2022, IIT Palakkad, 27th - 28th January, 2023.
6. Reiva Sibi, Praveena Gangadharan*, "Recovery of nutrients and water from source separated urine using an osmotic electrochemical system," Research scholars day 2022, IIT Palakkad, 27th - 28th January, 2023.
7. Sabarija A M, Praveena Gangadharan, Desalination coupled with wastewater treatment and energy production using microbial desalination cell, "Clean Energy

- Innovation" at the International Conference on Net-Zero Emission Technologies for Sustainable Development: Challenges and Opportunities (NOET - 2022) held at IIT (ISM) Dhanbad on December 12-13, 2022.
8. Sabarija A M, Sravan Janardhanan, Praveena Gangadharan, and Abdul Rasheed (2022). Improved defluoridation and energy production using dimethyl sulfoxide modified carbon cloth as bioanode in microbial desalination cell. The 6th International Conference and Postgraduate Colloquium for Environmental Research (POCER). June 9th-11th, 2022 in Langkawi, Malaysia.
 9. Anju Elizbath Peter, Praveena Gangadharan, Swaroop Sahoo, S.M. Shiva Nagendra, Monish Raj. (2021). Characterization of Real-Time Air Quality at Indian Institute of Technology Palakkad Campus. In 6th Indian International Conference on air quality management (IICAQM). IIT Madras, Chennai, 16-18.
 10. Sabarija A M, Praveena Gangadharan, Wastewater treatment coupled with defluoridation using microbial fuel cell, International Conference on Environmental Chemistry and Engineering (ICECE-20), 20th September 2020, Warangal, India
 11. Ankith Surya Ponnammalla, Praveena Gangadharan, Removal and recovery of nutrients and simultaneous generation of electricity from urine, ICGEES NIT Calicut, 5-6th August 2020.
 12. Charlotte Joseph, Praveena Gangadharan, Efficiency in Chromium removal from metal plating industry effluent by Electrodialysis, International Conference on Desalination (InDACon-2018), NIT, Tiruchirappalli, Tamilnadu, India, 20-21 April 2018
 13. Shalu Thomas, Praveena Gangadharan, "Application of PRB Technology for Cr(VI) remediation in groundwater using nano iron and scrap iron particles", International conference on desalination (InDACon-2018) , Department of Chemical Engineering, National Institute of Technology, Tiruchirappalli and Indian Desalination Association (InDA), April 20 - 21.
 14. Anupama S., Praveena Gangadharan, "Integrated Forward - Reverse Osmosis system for water reclamation", The first International Conference on Energy and Environment (ICEE 2018), NIT Calicut, Kozhikode, Kerala, India, March 9-10
 15. Praveena Gangadharan, Indumathi M Nambi, "Feasibility study of LCD monitor and carbon cloth electrodes for synchronized removal/recovery of Cr⁶⁺ by microbial fuel cells", The 8th international conference on environmental science and development (ICESD-2017), Frankfurt University of applied science, Frankfurt, Germany, February 8 - 10.
 16. Praveena Gangadharan, Indumathi M Nambi, "Hexavalent chromium reduction and energy recovery by using dual chambered microbial fuel cell", The 2nd Asia Pacific international society of microbial electrochemistry & technology (AP-ISMET) meeting, National University of Singapore, Singapore, July 21 - 23.
 17. Praveena Gangadharan, Indumathi M Nambi (2014), "Wastewater treatment coupled with chromium metal recovery & energy production using microbial fuel cell", 25th IPHE national convention on environmental engineering & 3rd

international conference and exhibition ENVISION 2025, CLRI, Adyar, Chennai, March 12 - 14, 2014.

11. National conferences:

1. Praveena Gangadharan, Shibu K ,Biosorption of chromium from aqueous solution by tendu leaf litters and maize leaf litters, Focusing on Advances in Civil Engineering, TKM College of engineering, Kollam, Kerala, 21st February, 2008.
2. Praveena Gangadharan, Shibu K , Biomedical Waste Management - A Case Study, Kerala Environment Congress, 2008, Thrissur, Kerala & 22nd April, 2008.
3. Praveena Gangadharan, Shibu K , Application of Microbial Fuel Cell in Waste Water Treatment, Kerala Environment Congress, Kollam, Kerala, 28th January 2009.

12. Professional Recognition/ Awards/ Prize/Fellowship

1. **Best Poster Award with cash prize of Rs. 3000/-** for the paper titled “Bioelectricity generation and fertilizer production coupled with water recovery from source-separated urine using a bio-osmotic resource recovery unit”, authored by Reiva Sibi and Praveena Gangadharan at SPARC funded INDO-US two day workshop on " Circular solutions to sanitation - Making profits from toilets" conducted by TAURI (Translating and Accelerating University Research and Innovation) research group, in IIT Madras on 29th and 30th March, 2023.
2. **Best oral presentation award** for a paper titled “Electrochemical phosphorous recovery from source separated urine using stale urine as a catalyst”, authored by Reiva Sibi and Praveena Gangadharan at the DST-SERB Sponsored National Conference on Bioenergy & bio-products from Agro-industrial sector and its associated Circular Economy (BACE-2023)10th and 11th March, 2023, Pondicherry University.
3. Awarded **First prize in oral presentation** for a paper titled “Desalination coupled with wastewater treatment and energy production using microbial desalination cell “, authored by Sabarija A M, Praveena Gangadharan, at the International Conference on Net-Zero Emission Technologies for Sustainable Development: Challenges and Opportunities (N0ET - 2022) held at IIT (ISM) Dhanbad on December 12-13, 2022
4. **Best Oral Presentation** (second runner-up) for the paper titled " Improved defluoridation and energy production using dimethyl sulfoxide modified carbon cloth as bioanode in microbial desalination cell', authored by Sabarija A M, Sravan Janardhanan, Praveena Gangadharan, and Abdul Rasheed at The 6th International Conference and Postgraduate Colloquium for Environmental Research (POCER). June 9th-11th, 2022 in Langkawi, Malaysia
5. Awarded **First prize** for the paper titled "Characterization of Real-Time Air Quality at Indian Institute of Technology Palakkad Campus", authored by Anju

Elizbath Peter, Praveena Gangadharan, Swaroop Sahoo, S.M. Shiva Nagendra, Monish Raj, in 6th Indian International Conference on air quality management (IICAQM). IIT Madras, Chennai, 16-18 December 2015.

6. **Best Poster Award** for the paper titled “Desalination coupled with wastewater treatment and energy production using Microbial Desalination Cell”, authored by Sabarija A M and Praveena Gangadharan on Research Scholars Day, IIT Palakkad, held on 6th November, 2021
7. **Early career research award** (2019) from SERB-DST.
8. **Best Poster Award**, for the paper titled “Efficiency in Chromium removal from metal plating industry effluent by Electrodialysis” at the International Conference on Desalination (InDACon-2018), held at NIT, Tiruchirappalli, Tamilnadu, India during 20-21 April 2018.
9. **Magudam Award by CNN-IBN:** Awarded by the Honorable Vice President of India Mr. Venkaiah Naidu in the year 2017 for the innovation of generating electricity from E-Wastes.
10. **Bhagyalakshmi and Krishna Ayengar Award with silver medal**, Received from Dr. Bhaskar Ramamurthi (Director of IIT Madras) and Mr. Nandan Nilekani, Co-founder of Infosys and former chairman of UIAD during the 54th convocation held at IIT Madras for the best Ph.D. project under the category of pollution in the year 2017.
11. **Finalist of Carbon Zero Challenge**, organized by the IIT Madras and IWMA with support from U.S. Consulate General, Chennai for the Incubation of Microbial Fuel Cell Technology in the year 2017.
12. **Best Paper Award** in the ICESD-2017 conference held at Frankfurt University of Applied Science, Frankfurt, Germany.
13. **Gandhian Young Technological Innovation Award** in the year 2015, Received from Dr. R.A. Mashelkar (Chairperson, NIF) during the festival of innovations hosted by the Rashtrapati Bhavan, New Delhi for inventing E-Waste as electrode in Microbial Fuel Cell for the removal/recovery of wastewater along with energy production.
14. **Best Poster Award** in the AP-ISMET Meeting at National University of Singapore, Singapore, in the year 2014.
15. **Women Scientist Scheme -A (WoSA)** from the Department of Science and Technology, Government of India, for developing Microbial Fuel Cell technology for the removal/recovery of wastewater along with energy production in the year 2014.

13. Student's Achievements

- Swati received best project award in Civil engineering for the B.Tech project titled “Optimisation and Comparison of Fenton and Photo Fenton Process for treatment of Textile Industry Wastewater” during the 1st convocation held at IIT Palakkad.

14. Invited Talks

1. Speaker to Prabhav Innovation Grand Challenge organized by TECHIN-GSCOE. On 4th February 2023 at Hotel Gokulam Park, Coimbatore. (Title of the talk: Resource Recovery from source separated urine: A sustainable Sanitation Practices to Improve Hygiene)
2. Speaker to Prabhav Innovation Grand Challenge organized by TECHIN-GSCOE. On 25th February 2023, Holiday Inn Roma Hall, Cochin. (Title of the talk: Innovative Approaches and Technologies for Decentralized Liquid Waste Management)
3. Speaker to deliver a 'Lightning Talk' in ACS Environment & Sustainability-themed event scheduled in New Delhi from November 6-8th, 2022 in collaboration with the Indian Institute of Science [IISc] & Indian Institute of Technology Delhi ACS Student Chapter. (Title of the talk: Development of Sustainable Techniques for Resource Recovery from Urine)
4. Speaker to the 2021 MRS Fall Meeting and Exhibit in Boston, Massachusetts on December 7, 2021.(Title of the talk: Resource Recovery from Wastewater Using Bioelectrochemical Systems)
5. Speaker to e-Faculty Development Program (FDP) on Integrated Urban Water and Wastewater Management July 27 to 31, 2020 (Title of the talk: Recovery of valuable metals from wastewater using Microbial Fuel Cells)
6. Speaker to e-Faculty Development Program (FDP) cum Workshop on "WASTE TO BIOENERGY" by Department of Life Sciences, School of Basic Sciences and Research, Sharda University, Uttar Pradesh and Department of Agricultural Engineering, Maharashtra Institute of Technology Aurangabad held from June 28 to July 4, 2020. (Title of the talk: Heavy metal reduction and recovery using Microbial Fuel Cells)
7. Distinguished Speaker to International Conference on Advanced Nanomaterials during December 12-13, 2019 at Chettinad College of Engineering and Technology, Karur, Tamil Nadu, INDIA. (Title of the talk: Wastewater Treatment Coupled with Resource Recovery using Microbial Fuel Cell)
8. Expert Speaker to E-Waste World Conference & Expo 2019 from 14-15 November 2019 at the Kap Europa, Frankfurt Messe, Germany. (Title of the talk: Wastewater treatment using E-Waste)
9. Resource person to FDP on Recent Advances in Fuel Cells, funded by APJ Abdul Kalam University from 8th to 12th July 2019 in SJCET, Palai. (Title of the talk: Microbial fuel cells- A sustainable approach to harvest renewable energy from waste)
10. Speaker to the women's Conclave on 8th March 2019 organized by DST - JNU, Delhi. (Title of the talk: My trust with destiny in research)

15. Press reports

<https://www.newindianexpress.com/cities/kochi/2017/oct/24/making-e-waste-matter-1681981.html>

<https://www.thehindu.com/news/national/kerala/iit-palakkad-launches-outreach-series-for-attappady/article67183818.ece>

16. Membership in Professional Bodies

- Member, International Water Association
- Member, Material Research Society
- Life member, Indian Society for Technical Education (ISTE)
- Member (2018-2019), International Society for Microbial Electrochemistry and Technology

17. Administrative assignments @ IIT Palakkad

- Project Director, Global Sanitation Centre of Excellence IIT Palakkad
- Member Executive Committee of TECHIN, 2022 - Present
- Member, C-Square Faculty Council, 2020 - Present
- Civil Engineering Stream Coordinator, August 2020 – October 2021
- Member, Board of Academic Courses, August 2020 – October 2021
- Member, Committee for bringing students back to the campus, 2020
- Committee Member, The batch of 2020: Awards, Prizes, and Medals Committee
- Orientation Programme - 2020, IIT Palakkad
- Core committee member, Orientation Programme - 2019, IIT Palakkad
- Lab in Charge (2018 – 2019), Department of Civil Engineering, IIT Palakkad
- Lab staff reporting officer, 2018 -2020
- Polling Officer, Institute Election 2019 - 2020
- Member, Anti-Ragging Cell (2018), IIT Palakkad
- Environmental Engineering Lab in Charge (2018 – Present)
- Observer in Charge, Institute Election-2018, IIT Palakkad
- Committee Member, Institute Day -2018, IIT Palakkad
- Member, Staff selection Committee 2019
- Member, Unnat Bharat Abhiyan (UBA Cell)

18. Additional Professional duties

- Guest Editor, Special Issue "Environmental Electrochemistry and Biosensors", Biosensors
- External M.Tech. Thesis Examiner 2018 -2020, 2022 NIT Trichy
- Member, Public Relation Committee, 32 Kerala Science Congress, 25-27 January 2020
- Judge for paper presentation event, 32 Kerala Science Congress in Mundoor, Palakkad on 25-27 January 2020
- Judge, PPTA Innovation Award – 2018, SCMS School of Engineering and Technology, Kerala, India
- Reviewer: Water Research, Fuel, Journal of The Institution of Engineers (India): Series A, International Journal of Hydrogen, Asian Journal of Water, Environment

and Pollution, Journal of Biological Engineering Research and International
Journal of Environmental Science Studies.