

Dr. Prabuddha L Gupta

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OBJECTIVE

Experienced researcher passionate about advancing algae research, dedicated to driving growth and improvements. Bringing expertise in research, academia, and industry to contribute to impactful projects and initiatives.

EDUCATION

- Sep 2016* **PhD (Energy and Environment Convergence - Applied phycology)**
Department of Energy and Environment Convergence,
Catholic Kwandong University,
Gangneung, South Korea
- June 2008* **M.Sc (Plant Physiology and Biochemistry)**
Department of Botany,
The Institute of Science, University of Mumbai
Mumbai, India
- June 2006* **B.Sc (Botany)**
Ramnarian Ruia College, University of Mumbai
Mumbai, India

THESIS

Phycoremediation of organic and inorganic pollutants by mixotrophic microalgal cultivation: Sustainable biomass and biofuel production.

RESEARCH AREA

Photobioreactors, Microalgae, Algae biofuels, Wastewater Treatment, Biomass, Constructed Wetlands, Algal Biotechnology

PROFESSIONAL EXPERIENCE

Arizona Center for Algae Technology and Innovation (AzCATI), Arizona State University, Mesa, AZ, USA

Assistant Research Scientist, June 2023 – Current

Postdoctoral Researcher, June 2022 - June 2023

- Conduct research and development on the Algae Productivity Exceeding Expectations (APEX) project for the U.S. Department of Energy (DOE), focusing on short and long-term objectives.
- Write research reports, reviews, and summaries for the APEX project, aligning with DOE objectives.
- Develop advanced cultivation methods to enhance throughput, including seed strategies and pond crash modeling.
- Investigate and manipulate phycosphere bacterial communities in ponds to enhance nutrient acquisition and overall algal fitness.
- Research crop protection, contamination mitigation, and Integrated Pest Management (IPM) using various methods.
- Implement measures to reduce predators, parasites, or pathogens for pest control and pond crash prevention.
- Design and perform research experiments, discussing alternative approaches and results with the team.
- Assist scientists in collecting and organizing laboratory data.
- Participate in lab meetings and project presentations.

Premas Biotech, Manesar, India

Senior Production Officer (Fermentation-Upstream), Sep 2021 – March 2022

- Executed upstream manufacturing activities and managed projects.
- Conducted upstream processing for both in-house and contract research projects.
- Prepared SOP/BMR for upstream processes.
- Managed growth and fermentation of various recombinant microorganisms on 5L, 75L, and 750L fermenters.
- Planned fermentation batches, raw material, and consumables for production campaigns.
- Ensured compliance with cGMP practices during manufacturing and collaborated with QA and QC for associated activities.
- Demonstrated knowledge in troubleshooting fermentation processes and process scale-up, including pre-seed, seed, and inoculum development.
- Managed manpower for efficient operations.
- Proficient in instrument handling and buffer/reagent preparation, including pH meter, spectrophotometer, batch centrifuge, continuous centrifuge, LAF, shaker incubator, autoclave, microscope.
- Experience in cGMP facility, ensuring timely closure of executed documents and batch records.

Marwadi University, Rajkot, India

Assistant Professor, Department of Microbiology, July 2017 – Sep 2021

- Implemented innovative instructional methods for UG and PG courses.
- Developed effective logistics to enhance student performance.
- Guided and mentored students in research projects.
- Monitored and evaluated student academic progress.
- Created and implemented career-enhancement programs and activities.
- Engaged in scholarly and creative endeavors contributing to the academic mission.
- Participated in departmental and college activities.
- Supported departmental committees, independent study, and dissertation projects.

Chembond Chemicals, Mumbai, India

Research Assistant, June 2013 – February 2014.

- Planning and designing wetlands for wastewater treatment.
- Implementation, execution, and construction of wetlands as per design plan for wastewater treatment.
- Gathering data for research, analyzing information and interpretation of results.
- Providing ecological solutions to treat wastewater in an eco-friendly manner.

Tata Consultancy Services, Pune, India

Project Associate – Clinical Publishing, June 2012 – May 2013.

- Maintains full understanding of eCTD, Non-Clinical, Clinical and Drug Safety report publishing and Compliance Checking process of Annexes, PDF Documents and Literature References.
- Compliance check report documents according to the PDF Compliance Tool Guideline and the Compliance Checklist for Word Documents.
- Provides project team leadership and manages publishing tasks. Initiate, plan, execute, control, and close assigned projects. Articulate procedures and solutions to multi-level team under time pressures imposed by business-critical deadlines.

CSIR-Central Salt and Marine Chemicals Research Institute, Bhavnagar, India

Project Assistant-II - Biofuel from marine microalgae, June 2010 - September 2011

- Ecological data and algal specimen collection along Gujarat coast
- Identification, Screening, and Isolation of potential lipid yielding strains along coast of Gujarat.
- Maintenance, culturing, and preservation of various axenic microalgae strains (Cyanobacteria, Chlorophytes, Rhodophytes, and Diatoms etc.)
- Phylogenetic species recognition using 16s and 18s rRNA techniques.
- Assisting in mass cultivation of microalgae, microalgae growth pattern studies, lipid extraction and biodiesel production of algal biomass
- Preparation of SOPs and reports

PUBLICATIONS

- **Gupta PL**, Rajput M, Oza T, Trivedi U, Sanghvi G* (2019) Eminence of Microbial Products in Cosmetic Industry. *Nat. Prod. Bioprospect*, 9: 4, 267–278.
- **Gupta PL**, Choi H-J, Pawar RR, Jung S-P, Lee S-M (2016) Enhanced biomass production through optimization of carbon source and utilization of wastewater as a nutrient source. *J Environ Manage* 184, Part 3:585–595.
- **Gupta PL**, Lee S-M, Choi H-J (2016) Integration of microalgal cultivation system for wastewater remediation and sustainable biomass production. *World J Microbiol Biotechnol* 32:139.
- **Gupta PL**, Choi H-J, Lee S-M (2016) Enhanced nutrient removal from municipal wastewater assisted by mixotrophic microalgal cultivation using glycerol. *Environ Sci Pollut Res* 23:10114–10123.
- **Gupta PL**, Lee S-M, Choi H-J (2015) A mini review: photobioreactors for large scale algal cultivation. *World J Microbiol Biotechnol* 31:1409–1417.
- **Gupta P**, Ann T, Lee S-M (2015) Use of biochar to enhance constructed wetland performance in wastewater reclamation. *Environ Eng Res* 21:36–44.
- Pawar RR, **Gupta P**, Lalhmunsiam, Bajaj HC, Lee S-M (2016) Al-intercalated acid activated bentonite beads for the removal of aqueous phosphate. *Sci Total Environ* 572:1222–1230.
- Lalhmunsiam, **Gupta PL**, Jung H, Tiwari D, Kong S-H, Lee S-M (2017) Insight into the mechanism of Cd(II) and Pb(II) removal by sustainable magnetic biosorbent precursor to *Chlorella vulgaris*. *J Taiwan Inst Chem Eng*.71:206–213.
- Kang H, Jeong J, **Gupta PL**, Jung SP (2017) Effects of brush-anode configurations on performance and electrochemistry of microbial fuel cells. *Int J Hydrog Energy*. 42:27693–27700.
- Pawar RR, Lalhmunsiam, **Gupta PL**, Sawant SY, Shahmoradi B, Lee S-M (2018) Porous synthetic hectorite clay-alginate composite beads for effective adsorption of methylene blue dye from aqueous solution. *Int J Biol Macromol*. 114:1315-1324.
- Lalhmunsiam, **Gupta PL**, Pawar RR, Lee S-M (2015) Use of Algal Biomass in the Remediation of Aqueous waste Contaminated with Cadmium. *Science and technology journal* 3(1): 14-20.
- Tea-woong A, **Gupta PL**, Choi C-H, Lee S-M, (2015) Effects of bio-catalytic media for nutrient removal in wetland using water plant. *KSWST Jour. Wat. Treat.* 23(1):75-81.

BOOK CHAPTERS

- **P Gupta**, AK Bishoyi, M Rajput, U Trivedi, N Singh, G Sanghvi (2022), Recent Trends in Microbe-Based Food Hydrocolloids in Recent Advances in Food Biotechnology, Springer, pp 211-241.
- Oza T, Gandhi D, Rajput M, Trivedi U, **Gupta P**, Chauhan J, Chapla R, Desai K, Sanghvi G* (2021) Biological Conjugates: Potential Role in Biomedical and Pharmaceutical Applications. In: Sarma H, Joshi SJ, Prasad R, Jampilek J (eds) *Biobased Nanotechnology for Green Applications*. Springer, pp 359–390.
- Saran, A., Sanghvi, G., **Gupta, P.**, Rajput, M., Oza, T., & Trivedi, U. (2021). Chapter 15—Heavy metal removal by nanobiotechnology. In S. Ghosh & T. J. Webster (Eds.), *Nanobiotechnology* Elsevier, pp. 235– 252.
- **P Gupta**, AK Bishoyi, MS Rajput, U Trivedi, G Sanghvi (2021) Chapter 1 - Biotechnological Advances for Utilization of Algae, Microalgae, and Cyanobacteria for Wastewater Treatment and Resource Recovery in Phycology-Based Approaches for Wastewater Treatment and Resource Recovery CRC Press. pp. 1-24
- **P Gupta**, U Trivedi, M Rajput, T Oza, J Chauhan, G Sanghvi (2021) Antiaging and Skin Lightening Microbial Products, in *Bioprospecting of Microorganism-Based Industrial Molecules*, 47-76, Wiley.
- **Gupta P**, Oza T, Rajput M, Trivedi U, and Sanghvi G (2020) Biofuel Production Methods, Challenges and Opportunities for Sustainable Development. In: Singh NK, Pandey S, Sharma H, et al *Green Innovation, Sustainable Development, and Circular Economy*. CRC Press.
- Sanghvi G, **Gupta P**, Rajput M, et al (2020) Microbial Strain Engineering. In: Singh V, Singh AK, Bhargava P, et al. (eds) *Engineering of Microbial Biosynthetic Pathways*. Springer, pp 11–32.

CONFERENCE PROCEEDINGS

- From development to cultivation complexities in outdoor cultivation, Algae Biomass Summit, October 9-11, 2023, Madison, WI, USA, 2023
- Low cost bio-sorption of heavy metals by microalgae *C. vulgaris*, Korean society of Environmental Engineers Conference (KSIEC), 2nd-4th May 2016, Yeosu, South Korea
- Harvesting of *Chlorella vulgaris* by using chitosan as bioflocculant, Korean society of Environmental Engineers Conference (KSIEC), 29th April–1st May 2015, Busan, South Korea
- Harvesting of *Chlorella vulgaris* by using chitosan as bioflocculant, 10th Asia Pacific Conference on Sustainable Energy & Environmental Technologies (APCSEET-2014), 2nd-5th July 2015, University of Seoul, South Korea
- Mixotrophic cultivation of *Chlorella vulgaris* in wastewater for nutrient removal and production of hydrocarbons, Korean society of Environmental Engineers Conference (KSIEC), 4th-6th Nov 2015, Jeju, South Korea
- Production of biodiesel by microalgal mats, Korean society of Environmental Engineers Conference (KSIEC), 30th April–2nd May, 2014, Jeju, South Korea
- Enhancing efficiency of constructed wetlands by using biochar, 2nd International conference on contaminated land, ecological assessment and remediation (CLEAR-2014), 5th-8th Oct 2014, Chuncheon, South Korea
- Mixotrophic cultivation of micro algae using glycerol, and its effect on nutrient removal from municipal wastewater, BIT's 3rd Annual International Congress of Algae-2016 (AICA-2014), 16th-18th Oct 2014, Dalian, China
- Mixotrophic cultivation of microalgae using glycerol, and its effect on nutrient removal from municipal wastewater, Korean society of Environmental Engineers Conference (KSIEC), 12th–14th Nov 2014, Daegu, South Korea

HONORS AND AWARDS

- Excellent paper presentation award: “Mixotrophic cultivation of microalgae using glycerol, and its effect on nutrient removal from municipal wastewater” presented at the Korean society of Environmental Engineers Conference (KSIEC), 12th–14th Nov 2014, Daegu, South Korea.
- Excellent poster presentation: “Low cost bio-sorption of heavy metals by microalgae *C. vulgaris*” presented at the Korean society of Environmental Engineers Conference (KSIEC), 2nd-4th May 2016, Yeosu, South Korea.

SKILLS

- Computer skills
 - MS-office (power point, excel, word)
- Phycology and Microbiology
 - All basic technique involved in Phycology and microbiology - Isolation and identification of microalgae and cyanobacteria, biochemical, pigments and composition analysis of microalgae, obtaining pure culture and maintenance.
- Analytical techniques
 - UV/Visible/Fluorescence Spectroscopy, GC-MS, HPLC, SEM EDX.
- Biochemistry and Molecular biology
 - Enzyme assay and enzyme kinetics, primer designing, SDS/Native PAGE, Agarose for DNA, PCR
- Languages
 - English, Hindi, Marathi, Korean (Limited)