



PRIYANKA MUTHU

Ph.D. Candidate in Marine Biology

National Taiwan Ocean University

Keelung, Taiwan

Marineking13895@gmail.com

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CAREER SUMMARY

I am an environmental microbiology researcher and Ph.D. candidate with expertise in marine microbial ecology, microplastics, plastisphere dynamics, and sequencing-based analysis of microbial communities. My research integrates field sampling, molecular biology, bioinformatics, and statistical analysis to investigate how plastic substrates shape microbial diversity, ecological assembly, functional potential, and pathogen-related signals in coastal and shallow-water hydrothermal vent environments. I have experience in Oxford Nanopore sequencing, microbiome and metagenomic workflows, R and Python-based data analysis, scientific writing, and interdisciplinary collaboration. I am seeking research and postdoctoral opportunities in environmental microbiology, microbial ecology, marine science, and related interdisciplinary fields.

RESEARCH INTERESTS

- Marine microbial ecology and plastisphere research
- Microplastic-associated biofilms, pathogens, and environmental health
- Community assembly, co-occurrence networks, and ecological succession
- Metagenomics, antimicrobial resistance genes, and virulence-related factors
- Environmental bioinformatics, sequencing data analysis, and reproducible workflows

RESEARCH EXPERIENCE

2020-Present Ph.D. Candidate, Institute of Marine Biology, National Taiwan Ocean University, Keelung, Taiwan

- Conduct independent research on microbial ecology of plastic-associated biofilms in dynamic coastal systems and shallow-water hydrothermal vents.
- Use Oxford Nanopore full-length 16S rRNA sequencing, microbiome profiling, taxonomic annotation, and comparative community analysis to evaluate substrate-driven and time-dependent microbial patterns.
- Apply R and Python for alpha and beta diversity analysis, ordination, PERMANOVA, co-occurrence networks, ecological assembly analysis, and data visualization.
- Develop current and planned projects on metagenomics, antimicrobial resistance genes, virulence-related factors, and functional divergence across contrasting marine environments.
- Lead manuscript writing, conference presentations, figure preparation, and collaborative data interpretation.

2022-2026 Teaching Assistant, ELTA North Center, Taiwan

- Supported English language teaching activities and assisted classroom coordination in the English Language Teaching Assistant Program.
- Strengthened communication, mentoring, and cross-cultural teaching experience while balancing active doctoral research.

2019-2020 Quality Controller, Sheng Long Biotech India Private Limited, Tamil Nadu, India

- Performed routine quality control activities, documentation, and process monitoring in an industrial setting.

2018-2019 Quality Controller, Nila Seafood Private Limited, Tamil Nadu, India

- Conducted quality assessment and product monitoring, with attention to laboratory procedures and reporting.
- 2016-2017 Volunteer, Ocean Cleanup Day**, Bay of Bengal, Tamil Nadu, India
- Participated in marine environmental clean-up activities and public environmental awareness efforts.

TECHNICAL EXPERTISE

- **Molecular biology:** Oxford Nanopore sequencing, DNA-based microbial community characterization, sample processing, and sequence interpretation.
- **Microbial ecology:** plastisphere research, microbial succession, pathogen-related profiling, environmental microbiology, and marine pollution interfaces.
- **Bioinformatics:** taxonomic classification, OTU-based analysis, microbiome and metagenomic workflows, ecological statistics, and reproducible data analysis.
- Programming and statistics: R, Python.
- **Analytical and imaging techniques:** Scanning electron microscopy (SEM), Fourier-transform infrared spectroscopy (FTIR), Raman spectroscopy, gas chromatography mass spectrometry (GC-MS), liquid chromatography mass spectrometry (LC-MS), high-performance liquid chromatography (HPLC), and environmental sample characterization.
- **Field and environmental research:** coastal and hydrothermal vent sampling, substrate comparison, environmental data integration, and interdisciplinary collaboration.

EDUCATION

2020-2026 Ph.D. in Marine Biology, GPA: 4.0

Institute of Marine Biology, National Taiwan Ocean University, Keelung, Taiwan

2016-2018 M.Sc. in Marine Science, CGPA: 8.42

Department of Marine Science, Bharathidasan University, Tamil Nadu, India

2013-2016 B.Sc. in Biotechnology, CGPA: 7.95

Department of Biotechnology, Bharathidasan University, Tamil Nadu, India

PUBLICATIONS

1. Subramani Thirunavukkarasu, Manickkam Jayakumar, Maduraiveeran Ramachandran, Santhosh Jeferson, Poovazhagi Rajendran, Jishnu Panamoly Ayyappan, Murugan Vasanthakumaran, **Muthu Priyanka**, Jiang-Shiou Hwang. Microplastic Contamination in the Ramsar Designated Pallikaranai Wetland, Southern India. MDPI Polymer (**Accepted- May-15, 2026**).
2. **Muthu Priyanka**, Jiang-Shiou Hwang, and Ying-Ning Ho. Temporal Heterogeneity of Pathogenic Bacterial Consortia on Plastisphere in Shallow-Water Hydrothermal Vents. Marine Pollution Bulletin. <https://doi.org/10.1016/j.marpolbul.2026.119563>
3. **Muthu Priyanka**, Bairoliya Sakcham, Girija Gowri, Tseng Li-Chun, Cao Bin, Hwang Jiang-Shiou, and Ho Ying-Ning. 2025. Substrate-Driven Microbial Diversity and Functional Potential of Plastisphere Biofilms in a Dynamic Coastal Ecosystem of Northeastern Taiwan. Environmental Pollution 389:127382. <https://doi.org/10.1016/j.envpol.2025.127382>.
4. Gowri Krishna Girija, Li-Chun Tseng, **Muthu Priyanka**, Yu-Ling Chen, Ying-Ning Ho, and Jiang Shiou Hwang. 2024. Microbiome flexibility enhances the resilience of the potentially invasive coral *Tubastraea aurea* to abrupt environmental changes: Insights from a shallow water hydrothermal vent transplantation study. Science of the Total Environment 954:176792. <https://doi.org/10.1016/j.scitotenv.2024.176792>.
5. **Muthu Priyanka**, Lee Y-C, Girija G.K., Chen Y-L, Ho Y-N, and Hwang J-S. 2023. Bacterial community responses of the hydrothermal vent crab *Xenograpsus testudinatus* fed on microplastics. Frontiers in Ecology and Evolution 11:1203647. <https://doi.org/10.3389/fevo.2023.1203647>.
6. Rajiv Gandhi, G., Maruthupandy, M., Ramachandran, G., **Muthu Priyanka**, and Manoharan, N. 2018. Detection of ESBL genes from ciprofloxacin resistant Gram-negative bacteria isolated from urinary tract infections. Frontiers in Laboratory Medicine 2(1):5-13. <https://doi.org/10.1016/j.flm.2018.01.001>.

MANUSCRIPTS IN PREPARATION

7. Assembly Mechanisms and Functional Divergence of Plastic-Associated Microbiomes in Distinct Marine Environments.
8. Metagenomic Profiling of Antimicrobial Resistance Genes and Virulence Associated with Diverse Plastic Polymers in Shallow-Water Hydrothermal Vents.
9. Harmful Bloom-Forming Plankton in the East China Sea (2015-2025): Taxonomic Patterns, Environmental Drivers and Management.
10. Toxicological Mechanisms of Microplastic and Lead (Pb) Interactions: Multi-level Responses in the Shallow Water Hydrothermal Vent Crab *Xenograpsus testudinatus*.

HONORS AND AWARDS

- National Taiwan Ocean University Outstanding Student Award, 2022, 2023, 2024, and 2025.
- Third Prize, The 14th International Conference on Earth Observations and Social Impacts, Miaoli, Taiwan, July 2025.
- First Prize, The International Conference Blue Economy, Karaikudi, India, January 2025.
- First Prize, Institute of Marine Biology Academic Poster Competition, Ph.D. Division, 2024.
- First Prize, The 10th International Symposium for Marine Biology and Biotechnology Academics Symposium, Pingtung, Taiwan, 2024.
- Solid and Hazardous Waste Research Scholarship, Air and Waste Management Association (A&WMA), 2022 and 2023.
- First Prize, Institute of Marine Biology Academic Poster Competition, Ph.D. Division, 2023.
- Third Prize, Institute of Marine Biology Academic Poster Competition, Ph.D. Division, 2021.

SELECTED PRESENTATIONS AND CONFERENCES

- Taiwan Fisheries Association Society Conference, Poster Presentation, January 2026.
- The 14th International Conference on Earth Observations and Social Impacts, Oral Presentation, Miaoli, Taiwan, July 2025.
- Taiwan Geo Assembly by Oceanographic Society in Taiwan, Poster Presentation, May 2025.
- The International Conference Blue Economy, Oral Presentation, Karaikudi, India, January 2025.
- Taiwan Fisheries Association Society Conference, Poster Presentation, January 2025.
- The 10th International Symposium for Marine Biology and Biotechnology Academics Symposium, Pingtung, Taiwan, October 2024.
- Asia Oceania Geosciences Society, Poster Presentation, Pyeongchang, South Korea, June 2024.
- PRIMO 22, Pollutant Responses on Marine Organisms Symposium, Oral Presentation, Nantes, France, May 2024.
- Oceanographic Society in Taiwan, Oral Presentation, 2023.
- The 15th UCAS Event, University of Hong Kong, Oral Presentation, October 2023.

LANGUAGES

Tamil: Native | English: Fluent | Chinese: Beginner

REFERENCES

Prof. Jiang Shiou Hwang, Ph.D.

Institute of Marine Biology, National Taiwan Ocean University, Taiwan

Email: jshwang@gmail.ntou.edu.tw

Prof. Hans Uwe Dahms

Department of Biomedical Science and Environmental Biology, Kaohsiung Medical University, Taiwan

Email: hudahms11@gmail.com

Prof. Ying Ning Ho, Ph.D.

Institute of Marine Biology, National Taiwan Ocean University, Taiwan Email:

ynho@email.ntou.edu.tw