

Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2022-132
Project Title:	Environment and Conservation Fund - Study of marine food web interactions and their responses to environmental gradients and coral bioerosion in Hong Kong eastern waters using environmental DNA
Principal Investigator:	Dr Cheng Jinping, Department of Science and Environmental Studies, The Education University of Hong Kong
Total Approved Grant:	\$952,200
Duration:	1/9/2023 to 31/8/2025
Project Status/Remarks:	On-going
Project Scope:	<p>The eastern waters of Hong Kong serve as a hotspot for marine biodiversity, especially for coral communities. Coral bioerosion by sea urchins is one of many urgent conservation problems for Hong Kong coral ecosystems, and the control of the sea urchin population is often suggested as a countermeasure. However, marine food webs and trophic interactions are intrinsically dynamic and are often gaps in knowledge not properly accounted for in strategising conservation planning. Multidisciplinary investigation of marine biodiversity and interspecies interactions at multiple trophic levels is fundamental to adequately address continuous marine resource conservation needs beyond species-by-species approach and controls. Monitoring the dynamics of the dominant and keystone species in the marine food web interactions can be further indicative of environmental health and conservation priorities within the grand scheme of marine ecosystem conservation.</p> <p>In this project, the structure and interactions of the marine food web covering primary producers to marine animals in eastern Hong Kong waters both within and outside of marine protected areas will be holistically investigated through networking analyses. This will be conducted using an environmental DNA metabarcoding approach with 16S rRNA, 18S rRNA, 12S rRNA, and COI gene markers. The aims of the project are (1) to holistically study the microbial, microfaunal, and macrofaunal biodiversity and compositional structure profile of marine and coral ecosystems in Hong Kong's eastern waters; (2) to study the responses of the total marine community across multiple trophic levels to changes in environmental conditions, coral community coverage and bioerosion; and (3) to reveal pivotal multi-trophic food web interactions in the marine and coral ecosystem in a spatial and temporal manner, which may have management implications for reducing coral bioerosion and conserving coral communities. The results will provide new baseline monitoring data for the marine community structure and their dynamic food web interactions to lay a new solid foundation for coral conservation planning and management in the eastern waters of Hong Kong.</p>

Summary of the Findings/ Outcomes:	To be available upon completion of the project
---	--