

Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2020-51
Project Title:	Territory-wide environmental DNA (eDNA) survey on distribution and status of invasive freshwater fish and crayfish
Principal Investigator:	Dr Lau Yin Kun Anthony, Science Unit, Lingnan University
Total Approved Grant:	\$500,000
Duration:	1/9/2021 to 31/8/2023
Project Status/Remarks:	Completed
Project Scope:	This project will determine the status of freshwater introduced alien species (IAS) across Hong Kong by combining environmental DNA (eDNA) detection and habitat occupancy modelling. More specifically, the project team will map the distributions of freshwater IAS, identify hotspots for release, and evaluate the ecological impacts of IAS on native species. This project will contribute towards Hong Kong's Biodiversity Strategy and Action Plan in facilitating conservation and management planning by advising on IAS monitoring and removal measures.
Summary of the Findings/Outcomes:	We conducted a study to understand the distribution of introduced freshwater fish and crayfish using a new method called environmental DNA (eDNA). This method is less labor-intensive than traditional surveys and can detect species that are difficult to find otherwise. We collected water samples from 17 reservoirs and 12 streams and used molecular techniques to analyze the samples. The newly established Australian redclaw crayfish was detected in six out of the 17 reservoirs, but none were found in the streams. We also found eDNA of numerous introduced freshwater fish species, with more introduced species than native ones in both reservoirs and streams. This suggests that management measures to prevent species introduction are not effective. Our work highlights the potential of eDNA as a tool for monitoring introduced species and suggests further research on quantifying species abundance. We also advocate stronger preventive measures, such as increasing patrols, amending regulations to discourage illegal releases, and strengthening public education to prevent the introduction of invasive species. The study also detected eDNA of some locally rare or threatened species, indicating the potential for using eDNA to help conserve native species.