

## Environmental Research, Technology Demonstration and Conference Project

<b>ECF Project:</b>	ECF 2022-92
<b>Project Title:</b>	Environment and Conservation Fund - Baseline characterization of mercury levels and its potential toxicity in shorebirds in Mai Po Nature Reserve and Deep Bay
<b>Principal Investigator:</b>	Dr Tsui Tsz Ki Martin, School of Life Sciences, The Chinese University of Hong Kong
<b>Total Approved Grant:</b>	\$495,200
<b>Duration:</b>	1/8/2023 to 31/7/2025
<b>Project Status/Remarks:</b>	On-going
<b>Project Scope:</b>	<p>Mai Po Nature Reserve and Deep Bay are internationally recognised as stopover sites and wintering habitats for migratory birds. Mai Po is located about midway through the East Asian-Australasian Flyway. The wetland habitats including mudflats, mangroves, Gei Weis, and freshwater ponds provide nurturing grounds for diverse prey items for the birds. However, the downside of wetlands would be the low-oxygen environment which promotes the bacterial conversion of non-toxic inorganic Hg (HgII) to highly toxic methylmercury (MeHg) (Liu et al., 2022). Once produced, MeHg can be efficiently bioaccumulated and increased in concentration along the food chain (i.e., biomagnification), which can lead to very high and potentially toxic levels in top consumers like insectivorous and piscivorous birds. As a first step, intensive sampling of diverse shorebird species at Mai Po is warranted to better understand and characterise the Hg levels in these critical animal migrants. This project plans to spend the first 12 months sampling the feathers of shorebirds through the collaboration with Hong Kong Waterbirds Ringing Group. The sampling period will be 12 months with a frequency of one to two times per month. With a subset of bird species with high Hg levels (e.g., Common Redshank and Marsh Sandpiper), the project will examine the relationship between blood and feather Hg because blood Hg reflects more recently assimilated MeHg from diets. Further, the project will also analyse total Se content in the feather samples in order to calculate the Se:Hg ratio to infer the toxicity of Hg imposed, if any. Because the shorebirds could easily cross the mainland-Hong Kong border within the Deep Bay area, the project plans to collect feather samples of shorebirds from the Futian Mangrove Nature Reserve in Shenzhen. Furthermore, it will collect potential prey items for shorebirds such as invertebrates within Mai Po and Futian. In particular, it plans to have intensive field sampling of invertebrates over the one-year sampling period in Mai Po. In Futian, it will collect these small creatures to better characterise their MeHg levels.</p>
<b>Summary of the Findings/ Outcomes:</b>	To be available upon completion of the project