The University of Hong Kong
School of Biological Sciences

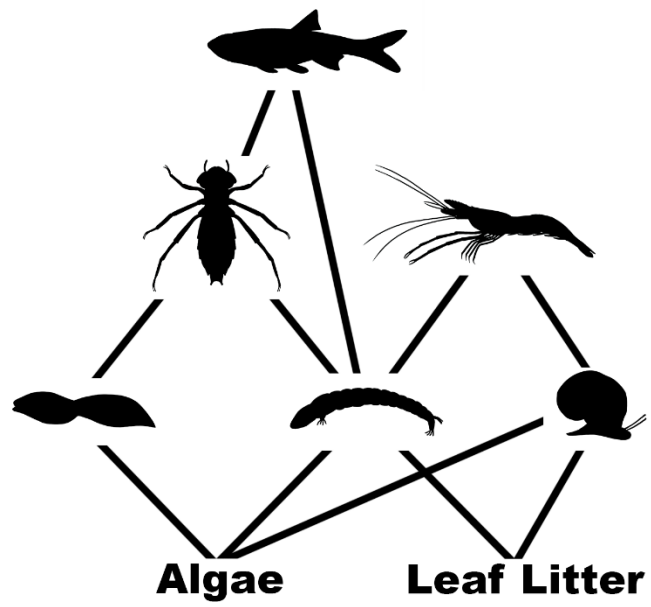
Public Seminar

Aquatic Food Webs in Anthropogenic Landscapes

Date: 11 May 2023 (Thursday)

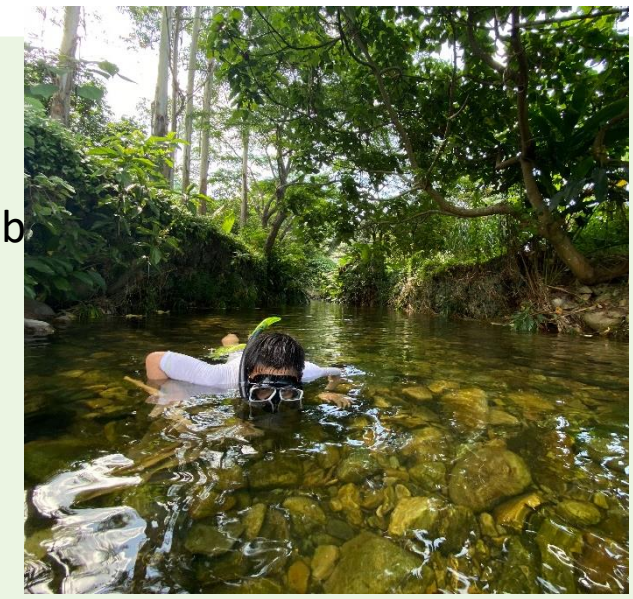
Time: 14:30 – 15:15

Venue: KBSB 6N-11 & Zoom



About the speaker:

Ziqi Chen is a PhD student at Prof. David Dudgeon's laboratory. His research focuses on food webs in streams, freshwater marshes, and tidal shrimp ponds.



Abstract:

Anthropogenic influences are reshaping all ecosystems, requiring renewed understanding of determinants of food-web structure in anthropogenic landscapes such as Hong Kong. To this end, I examined how the extent of human settlements in headwater catchments affect stream food-web properties. I also examined the trophic basis of secondary production in two habitats strongly influenced by human activities: freshwater marshlands and tidal shrimp ponds.

I analysed 27 global stream food webs, finding that streams in catchments with higher levels of settlement exhibited reduced trophic specialisation. I further tested this trend by examining predator gut contents in four Hong Kong streams. Unexpectedly, diet breadths of individual predators and the predator guild did not shift in response to settlement levels.

Food webs in three freshwater marshlands exhibited isotopic signatures that indicate assimilation of vascular plants, detritus, and microalgae, while fatty-acid profiles suggested assimilation of detritus. However, additional evidence suggests that filamentous algae, periphyton, cyanobacteria, and an unsampled food were also eaten. In three tidal shrimp ponds, stable isotope mixing models revealed that algae were a major food source for most consumers, while mangrove detritus or particulate organic matter were also significant for many taxa; reeds were generally unimportant as an energy source.

One overall finding of my study was that despite the variety of methods I used to analyse food webs in streams, marshes and tidal shrimp ponds in Hong Kong, and the marked differences in conditions prevailing during dry and wet seasons, seasonality had a minor influence on food-web architecture despite major effects on assemblage composition.