



The University of Hong Kong  
School of Biological Sciences

**Public  
Seminar**

# Investigation on the feeding ecology of horseshoe crabs *Carcinoscorpius rotundicauda* and *Tachypleus tridentatus* in Hong Kong using DNA metabarcoding

**Date: 17 June 2022 (Friday)**

**Time: 10:00 am**

**Venue: KBSB 6N-11 & Zoom**



## About the speaker:

**Boyee LEE**, a MPhil student in Dr. Simon SIN's lab. Her research interests fall into molecular and behavioural ecology. Her research focuses on the investigation of feeding ecology using DNA metabarcoding approach. She also took part in an environmental DNA study, revealing cryptic fauna biodiversity in Hong Kong western waters using seawater and sediment samples with DNA metabarcoding approach.



## Abstract:

Horseshoe crabs provide important ecological services in the coastal marine habitats, but their populations are declining globally, leading to major concerns on conservation of these iconic animals. Baseline information of horseshoe crab ecology, such as their trophic role and food source, is a pre-requisite for habitat protection plan and captive restocking program. Yet, feeding ecology of Asian horseshoe crabs is relatively poorly understood. To investigate the foraging ecology of horseshoe crabs, I have developed a non-invasive protocol using DNA metabarcoding analyses to investigate the dietary compositions of *Carcinoscorpius rotundicauda* (CR) and *Tachypleus tridentatus* (TT) juveniles in Hong Kong. This project aims to determine 1) their trophic roles and dietary preferences; 2) interspecific dietary differences; and 3) temporal and ontogenetic differences in their diet compositions in response to prey availability.

The results suggests that both species were omnivores but mainly exhibited carnivorous behaviour. Oligochaete was the major prey group for both CR and TT. Crustacean was another group of prey that contributed a relatively high proportion of diet in CR. Surprisingly, anthozoan contributed a considerable portion of TT diet, which was not reported before. My findings highlight the previously unknown contribution of burrowing anemone as the food source of TT, and future studies on the importance of this dietary component for the survival of TT juveniles are needed. Significant interspecific dietary differences were also observed in the two species, and both species showed dietary preferences as the major preys were not the dominant taxa in the corresponding habitats. Besides, significant temporal variations in the diets of CR and TT juveniles were observed, while ontogenetic dietary differences were only observed in TT of which body size exhibits more prominent changes among instar stages. The results also showed that both species consumed more algae and bivalves when these items were abundant while the preferences on the other food items were not affected by availability, suggesting that the juveniles were capable to adjust their food consumption and accommodate to their habitats. This study provides new insights into the feeding ecology of the two Asian horseshoe crab species and establishes a new framework for future molecular analyses on horseshoe crab diets around the world.