



The University of Hong Kong
School of Biological Sciences

Public
Seminar

Immovably flexible: Spatial variation in emersion stress responses by *Saccostrea cucullata*

Date: 9 Jan 2025 (Thu.)

Time: 10:00 a.m.

Venue: KBSB



About the speaker:

Chiu Sung Yau is a PhD candidate supervised by Prof. Gray A. Williams. His research focuses on the thermal physiology, spatial variation of physiological and behavioural responses in intertidal bivalves.



Abstract:

Saccostrea cucullata is an intertidal oyster that dominates most sheltered hard shores around the Indo-Pacific Ocean. Dictated by the tides and modified by various regional and local abiotic factors, environmental conditions on shores vary spatially and temporally, creating different thermal regimes which affect the species found on them. This study investigates the various strategies oysters can adopt to persist in this dynamic and stressful habitat where resources are limited.

Investigation of the thermal environment and physiological responses of oysters from different thermal regimes (sites and tidal heights) around southern Hong Kong demonstrated their life histories are closely related to their local environmental factors. This local acclimation was also seen in their physiological responses during emersion, with oysters showing different degrees of oxygen deprivation and hyperosmotic stress between shores and tidal heights. Local acclimation was further supported by spatial variation in cellular heat shock responses (cellular HSR) of the oysters. Oysters also showed variation in cellular HSR before and after common garden acclimation, indicating spatial variation in oysters' cellular HSR was associated with individuals' past thermal histories. While oysters did not display air-gaping behaviour during emersion, they displayed feeding behaviours that varied between shore heights and seasons when immersed, which, combined with the energetic trade-offs required for stress responses in different thermal regimes, explained the variation in their energetic status and reproduction measured throughout the summer. Overall, *Saccostrea cucullata* adopt varying strategies in response to their specific, residing thermal regimes, which leads to variations in their survival and energetic trade-offs. Considering the oysters are exposed to thermal regimes close to, and sometimes exceeding, their upper thermal limits, these oysters may be susceptible to warming conditions, resulting in changes in their future distribution and the subsequent local biodiversity patterns.