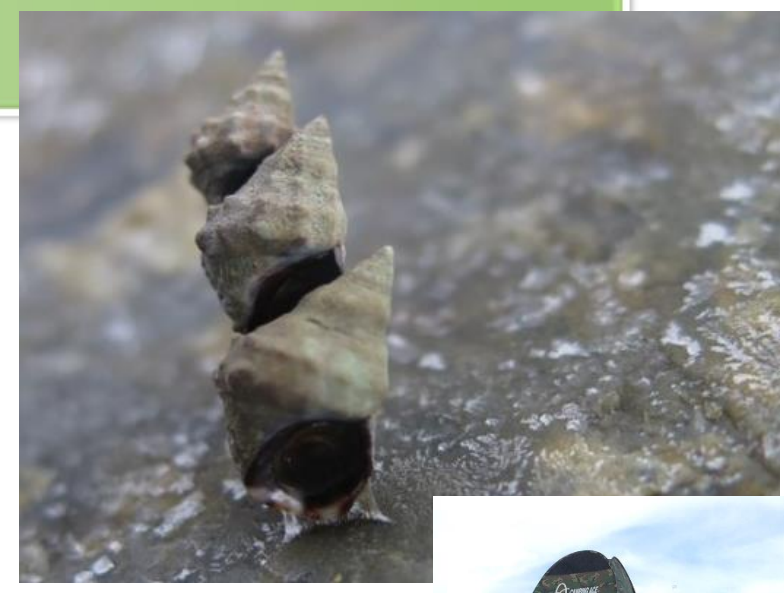
The University of Hong Kong
School of Biological Sciences

Public Seminar

Thermal extremes and variability shape the performance of rocky shore littorinids



Date: 16th Feb 2021 (Tue)

Time: 15:00 (UTC+8)

Venue: 6N-11

About the speaker:

Sarah Lok Yee LAU is a PhD candidate in the Tropical IntertiDal Ecology (TIDE) group supervised by Professor Gray A. Williams. Her research looks at how tropical intertidal species thrive on such a thermally dynamic and harsh environment.

Abstract:

Across latitudes, climatic regimes shift from hot but relatively stable in the tropics to relatively benign but variable in temperate regions. As a result, ectotherms in these different regimes exhibit contrasting thermal performances (e.g. in sensitivity and plasticity). Some tropical areas like Hong Kong, however, also experience variable climates driven by the monsoons and species in these areas endure both extreme heat in the tropical summer as well as thermal variability across seasons. The challenges to survive these supposedly conflicting thermal regimes are further magnified in the intertidal system, where species transition from the stable marine environment to variable and extreme physical conditions during low tides. To determine the strategies species use to cope with both thermal extremes and variability, I investigated the behaviour, physiology and energetics of three congeneric (*Echinolittorina* species) snails living on the mid to high shore.

On-shore surveys showed, despite living on rocks exceeding their thermal limits, these snails are buffered from reaching lethal temperatures due to their effective thermoregulatory behaviours. To meet the energy costs incurred from frequent exposure to high temperatures, the behavioural (locomotion) and physiological (resting metabolism) thermal performances of the high shore species revealed strategies to maximize energy gain to expenditure. All three species showed seasonal acclimation in their thermal performance, but this plasticity differed between behavioural and physiological metrics, presumably as a result of selection under different thermal regimes (i.e. seawater and air temperatures). Behavioural surveys recorded clear seasonal changes and energetic models indicated that the reduced winter activity could be attributed to increased risk of wave dislodgment.

Using Hong Kong rocky shore littorinids as a model, this study revealed the suite of strategies species utilize to cope with thermal extremes and variability which underpin their survival in the hot but variable monsoonal tropics.