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**Mollusc study, Bamfield Marine Sciences Centre, Canada**

The research I conducted on Vancouver Island, Canada was prompted by my PhD in which I examined metabolism in the marine molluscan class Polyplacophora, the chitons. Chitons, although common and found worldwide from the deep-sea to intertidal habitats, are highly understudied and we know little about their ecology and next to nothing about their potential vulnerability to climate change.

The Black Katy chiton *(Katharina tunicate)*

I am interested in how climate change, such as increased temperature, ocean acidification and hypoxia, alters metabolism in marine invertebrates. In my PhD thesis I showed that body size was an additional factor that could affect the responses of different species to climate change. The research was conducted at Bamfield Marine Sciences Centre, Vancouver Island. I collected approximately 100 specimens of *Katharina tunicata,* a common large species in this region. To examine metabolic scaling, or how metabolism changes with body size, individuals representing the full size range of the species were collected, from under 0.5g to over 50g wet mass. Half of these specimens were collected from the intertidal and half from the subtidal at a depth of 10-20m.

I am interested in the different responses to temperature of populations exposed to different thermal regimes. In the intertidal, organisms are exposed to large twice-daily temperature fluctuations when the tide goes out, contrasted with the more thermally-stable subtidal habitat. These different populations were acclimated to a temperature increase of 5°C, along with control groups held at ambient seawater temperatures, and these groups then examined for metabolic rate in the form of oxygen uptake. Specimens were sealed in respirometry chambers of known volume of seawater, kept at the appropriate temperature using a waterbath, and oxygen uptake over time measured using optical oxygen probes.

Although I am still analysing my data, preliminary results support earlier findings on the same species from my PhD that size affects response to abiotic factors; metabolic scaling decreased with increasing temperature. Metabolic scaling also appears to be lower in the subtidal population compared to the intertidal population, potentially indicating different size-determined energetic patterns in these two populations.

This research visit to Bamfield also provided an opportunistic chance to work on another highly understudied molluscan class, the scaphopods (also known as tusk shells). This scarce group lives at depth in sediment where it feeds on organic particulate matter, and is often found in great densities. Like the chitons, very little is known about this group's physiology and ecology, or their contribution to nutrient cycling in the marine environment. On this visit I conducted the first ever physiological experimental work done on this group, measuring metabolic rate at different temperatures of the species *Rhabdus rectius*. In addition, my collaborators undertook some behavioural work examining how this species buries itself in the sediment. This experimental physiological work along with the behavioural component will form an additional publication examining the contribution this group makes to nutrient cycling in benthic habitats.

Scaphopods (*Rhabdus rectius*)

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