

CALCIUM CONTENT OF SKELETONS OF ANTARCTIC AND NON-ANTARCTIC MARINE INVERTEBRATES

S Watson¹, LS Peck², PA Tyler¹

¹*National Oceanography Centre, Southampton, Southampton, United Kingdom*, ²*British Antarctic Survey, Cambridge, United Kingdom*

Calcium carbonate is an essential component of the shell or skeleton of many marine invertebrates, including molluscs, echinoderms and brachiopods. There exists a long-standing hypothesis in marine biology that shells of bivalve and gastropod molluscs are thinner at high latitudes. Using latitude as a proxy for temperature, it has been proposed that at lower temperatures when calcium ions are more energetically expensive to remove from seawater, shells will be thinner or alternative ions substituted into the skeleton. Data for gastropod molluscs seems to support this hypothesis. However, data supporting this hypothesis are rare. This research focuses on the variation and patterns in shell thickness and skeletal composition from a range of sample organisms, including phylogenetically constrained congeneric comparisons from representative latitudes. Organic content is being determined by AFDW analyses. SEM EDS techniques are being used to measure elemental content (Ca, Sr, Mg) and data related to thickness or density of the skeleton. The work will continue with additional studies on the cost of skeleton deposition relative to standard metabolic rate and evolutionary effects of predation pressure in order to relate latitudinal differences to physiology and ecology. Understanding the chemistry and biological function of the calcium skeleton will help to predict the effects of environmental change on marine invertebrates. Antarctic marine species are stenothermal and limited to life within a narrow temperature range. If thinner shells and substitution of alternative ions into skeletons is a function of temperature or pH, then Antarctic species are likely to be amongst the first calcifying organisms affected by climate change or ocean acidification.

(Note to Selection Panel: Please note this is a new study with few results at present. As a consequence, I have not included the result section in the abstract. I would very much appreciate the chance to present my results properly in poster form at SCAR 2006 and receive valuable feedback on this new and exciting work.)