

Interactive comment on “Fluctuations of sulfate, S-bearing amino acids and magnesium in a giant clam shell” by T. Yoshimura et al.

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This manuscript deals with sulfate, S-amino acids and Mg in the giant clam, *H. hippopus*. These chemical species are considered in terms of environmental conditions and, importantly in the context of ontogeny. The strength of the manuscript is the fact that it deals with these important chemical species in meticulous detail in the environmental and ontogenetic context, providing novel insight for both. The fact that the Mg concentration correlates with sulfur amino acids, rather than sulfate, seems to contrast with some calcite biominerals where there is a correlation between Mg and sulfate and the Mg is a true lattice component. This is likely to all relate to the crystallography and the relative ease with which Mg can substitute for Ca in the calcite lattice with both Mg and sulfate being incorporated into calcite more readily at high precipitation rates. It is

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interesting to note the annual fluctuations in sulfate concentration and the fact that their amplitude increases with age. This contrasts with the concept of sulfate incorporation increasing with precipitation rate. The authors present interesting discussion on this phenomenon by way of the chemistry of calcifying fluids indicating that this may be a useful means of considering the influence of environmental change on calcifying fluid chemistry. The authors provide fascinating data, giving the reader a lot to think about along with an ontogenetic and environmental framework in which to consider these data.

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