Stable oxygen isotopic variations in modern *Achatina* land snail shells from Southern India and their relation to rainwater isotopic composition

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High resolution reconstruction of terrestrial climatic record using proxies is a challenging task. Here we used the stable oxygen isotope ratios in the carbonate of land snail shells for environmental reconstruction. Studies concerning the controls of isotopic variations in modern land snail shells with observed regional climatic parameters provide a motivation for this study [1]. Here in this study, the land Snail *Lissachatina fulica* (Bowdich), a representative member of the family Achatinidae, one of the most invasive Mollusc species with a high growth rate were sampled from S. India (Bangalore). In the study we observed variability in the stable isotopic composition of aragonite sampled at intervals along the growth axis of 2 shell specimen and compared it with estimated $\delta^{18}O$ of aragonite precipitated in equilibrium with average monthly isotopic composition of rain water. Daily rainwater samples were collected during the period March to July, 2008. Live snail samples were collected on 16th July, 2008 and stable isotopic analyses were performed. Oxygen isotopic values of shell carbonate varies between 2‰ to -5‰ w.r.t. VPDB consistent with the estimated $\delta^{18}O$ of aragonite. The oxygen isotopic composition appears to be mainly a function of the rainwater isotopic composition, with direct influence of rainfall amount and evaporative effects. Our results indicate that the $\delta^{18}O$ values of shell carbonates are enriched by 3-4‰ relative to estimated aragonite precipitation in dependence with monsoonal wind patterns. Our observations also showed a low inter sample variability, clearly demonstrating the use of *Achatina* shell carbonate as a high resolution proxy for understanding the changes in the isotopic composition of rainwater over shorter timescales

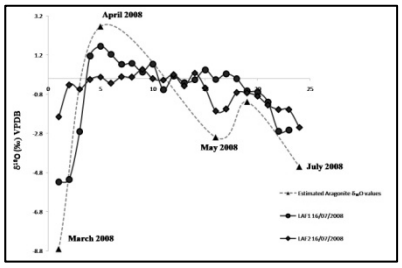

Figure 1:

Leng M. J., Heaton T. H. E., Lamb H. F., Naggs F. (1998), *Holocene*, Vol. **8**, 4, pp.407-412.

Advanced methods to characterize nanomaterials for environmental toxicity studies

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While nanotoxicology and econanotoxicology studies have made strides in the last few years, basic questions still surround the mechanisms of toxicity and best practices for testing nanomaterials and comparing the resulting datasets. A fundamental question is "what are we actually dosing the organisms with?" Addressing these basic questions begins with a thorough characterization of nanomaterials before, during, and at the completion of toxicity tests.

Flow field-flow-fractionation (Fl FFF) is a technique that separates nanoparticles (NPs) by hydrodynamic diameter. By coupling Fl FFF with inductively coupled plasma-mass spectrometry (ICP-MS), we have characterized the size, polydispersity, size-dependent metal content and element ratios of commercially available CdSe/ZnS quantum dots. Significant differences in NP characteristics, particularly elemental ratios, existed between manufacturers and between different types from the same manufacturer.

The characterized dots were shown to have different toxicity thresholds to *Daphnia magna* that may in part be more fully explicated by the results of the charaterization studies. Results of both characterization and toxicity studies will be presented and compared.