Study of land snail shell and body fluid oxygen isotopic compositions from laboratory culturing experiment of subspecies *Acusta despecta sieboldiana*

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The oxygen isotopic composition ($\delta^{18}O$) of land snail shell is regarded as a useful tool to reconstruct the paleo-environmental parameters such as $\delta^{18}O$ values of precipitation, rainfall amount, relative humidity and temperature [1, 2]. Although it has been widely applied in modern and paleo studies so far [e.g. 3, 4, 5], the clear relations among shell $\delta^{18}O$ values and its controlling factors are still not well understood. In particular, given that the direct observation of land snail body fluid $\delta^{18}O$ values is limited, it is hard to judge whether the relationship between oxygen isotopic fractionations and surrounding temperatures during carbonate precipitation is same as the one observed from ocean animals and inorganic carbonate.

In this study, we cultured land snails hatched from eggs under various environmental conditions and they were fed by three kind of waters with constant but different $\delta^{18}O$ values. We have directly measured the snail body water $\delta^{18}O$ values and compared them with the bulk shell $\delta^{18}O$ values at each fixed temperatures.

Based on the observations, we will discuss the effectiveness of flux balance model raised by Balakrishnan and Yapp [2]. We will also report the relationship between snail shell $\delta^{18}O$ values and body water $\delta^{18}O$ values at various temperatures obtained from lab cultivation. These observations and discussions will greatly improve our comprehension on the behaviour of oxygen isotope compositions during land snail shell carbonate precipitation and prompt its application in Quaternary studies.

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