

Freshwater mussel shells(*Hyriopsis* sp.) as archives of environmental informations

Hisato Izumida^{1*}, Toshihiro Yoshimura², Naotatu Sikazono¹, Atsushi Suzuki³,
Hodaka Kawahata², Rei Nakashima³, Masaya Yasuhara³, Akihiko Inamura³

¹Keio University, ²The University of Tokyo, ³Geological Survey of Japan, AIST

Bivalves occur in various environments such as from polar region to high latitude region, in freshwater and marine, and have carbonate shells which are formed by addition growth. So they have the potential to contain within their isotope and elemental composition signatures that reflect the paleoenvironmental information. Freshwater environment of continental areas not only sensitively reacts to the climatic condition but also plays a role to the transportation of the material which weathers chemistry and physical. However, there is no such reconstruct record as water temperature, element concentration and isotope composition excluding the instrumental measure. So freshwater bivalves are paid attention as paleoenvironmental archives. But there are many reports about marine bivalves, but about freshwater bivalves is little. We present the results of Sr/Ca ratios and sclerochronology of shells of the cultured freshwater pearl mussel (*Hyriopsis* sp., Unionidae).

Three specimens which have same growth history were analyzed for elementary composition by ICP-MS, observed structure of shell under the microscope and naked eyes. We compare Sr/Ca ratios of shells and water temperature, Sr/Ca ratio of water and annual growth rate. Sr and Ca concentrations of water were analyzed by ICP-AES after were passed through filter(0.45um). The profile of first-order fluctuations of Sr/Ca ratios of outer shell layer along the maximum growth axis was consistent with the profile of oxygen isotope ratios of the shell, which is known as a proxy of temperature ($r=0.58$, $p<0.01$). But the profile of Sr/Ca ratios of three specimens were also influenced by aging effect. On the other hand, Sr/Ca ratios of ambient water showed almost no fluctuations. So the dominant factor controlling Sr/Ca ratios of shell fluctuations was water temperature.

Keywords: freshwater mussel, Sr/Ca