Study on geochemical composition of precious coral skeletons

Kentaro Tanaka[1*], Akizumi Ishida[1],
Kotaro Shirai[1], Masako Hori[12], Naoto Takahata[1]
and Yuji Sano[1]

[1]Atmosphere and Ocean Research Institute, University of
Tokyo (*corresponding author: kentaro.t1@gmail.com)
[2]Current address: Osaka Kyoiku University

Precious corals living in the deep oceans produce calcite skeletons, while their growth rate is significantly smaller than aragonitic skeletal growth of reef-building corals in the surface oceans. The skeletal composition of precious corals includes a possibility to provide deep-sea conditions, such as temperature, salinity and pH. However, the biomineralisation mechanism and factors controlling the chemical compositions of precious coral skeletons are still poorly understood. We present preliminary data on geochemical analyses of precious corals to better understand biomineralisation and controlling factors of trace element incorporation into the skeletons, potentially linking with deep-sea environments.

After cutting perpendicular to the growth axis, two-dimensional mapping of magnesium (Mg/Ca) and sulfur (S/Ca) distribution in the cross section of precious skeleton collected from the Pacific Ocean was obtained by electron probe microanalyzer. Distribution pattern of Mg/Ca clearly showed concentric banding with the center of cross section having significantly higher Mg/Ca ratio. Sulfur distribution also had banding patterns, although higher S/Ca bands are consistent with lower Mg/Ca bands.

We also plan to measure Mg/Ca, Sr/Ca amd Ba/Ca ratios together with other trace element contents, such as B/Ca, F/Ca and Cl/Ca in the skeleton using laser ablation-ICP-MS [1] and NanoSIMS [2] to assess how trace elements are incorporated into the skeletons.

[1] Oda *et al*. (2006) *Geochemistry* **40,** 231-238. [2] Sano *et al*. (2005) *Anal. Sci*. **21,** 1091-1097.