

## Stable carbon and oxygen isotopes in the shell of deep-sea mussels

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Oxygen and carbon isotope composition of shells for deep-sea mussels *Bathymodiolus* spp. were measured to compare the environmental situation between the hydrothermal vent and the hydrocarbon seep. Oxygen isotope composition is known to be controlled mainly by seawater temperature and oxygen isotope composition of seawater, which in turn is correlated with salinity. In contrast, carbon isotope composition is believed to be affected by carbon isotope composition of dissolved inorganic carbon in seawater and physiology of the animals. The samples were collected from hydrothermal vents fields at Hatoma Knoll in the Okinawa Trough and Myojin Knoll in the Izu-Ogasawara arc, and the hydrocarbon seep area in the Gulf of Mexico.

Stable isotope compositions of shells varied from 2.57 permil to 4.08 permil for oxygen isotope composition, and from -4.69 permil to 6.53 permil for carbon isotope composition. Oxygen isotope compositions range within 1.5 permil for all specimens suggests that the mussels might live in quite stable habitat conditions for long term. Carbon isotope compositions indicated more than 11 permil variation than that of oxygen isotope composition. The carbon isotope composition of the shells collected from hydrothermal vent fields showed higher ratios than those from the hydrocarbon seep area. The different carbon isotope values may be attribute to carbon isotope compositions of DIC in the difference types of water fluid.

The stable isotope compositions of living animals provide valuable information on the habitats conditions such as ambient temperature. Thus, the data of isotope composition of present species may contribute to elucidate the ecology of fossil species and to estimate the habitats condition.