Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

BPT24-P03 Room:Convention Hall Time:May 24 18:15-19:30

Thermal effect for distribution of deep-sea chemosynthetic faunas

WATANABE, Hiromi[1*] ; YAHAGI, Takuya[2] ; NAGAI, Yukiko[1] ; SEO, Mihye[2] ; KOJIMA, Shigeaki[2] ; ISHIBASHI, Jun-ichiro[3] ; YAMAMOTO, Hiroyuki[1] ; FUJIKURA, Katsunori[1] ; MITARAI, Satoshi[4] ; TOYOFUKU, Takashi[1]

[1]Japan Agency for Marine-Earth Science and Technology, [2]Atmosphere and Ocean Research Institute, the University of Tokyo, [3]Kyushu University, [4]Okinawa Institute of Science and Technology

Temperature is an important factor affecting the distribution and life-history traits of marine animals. Deep-sea hydrothermal vent is a suitable environment to examine ecological differences related to temperature, due to the steep temperature gradients in their vicinity. We will discuss thermal effects for distribution of deep-sea chemosynthetic faunas based on the recent results from rearing experiments.

We conducted rearing experiments using two hydrothermal vent shrimps, *Shinkaicaris leurokolos* and *Alvinocaris longirostris*, because these two species shows different distribution near hydrothermal vents; centrally-distributed *S. leurokolos* and peripherally-distributed *A. longirostris*. The rearing experiment was conducted under atmospheric pressure, with a temperature range of 5-30 ℃, to demonstrate a difference in thermal effects on egg hatching and larval activity between the two shrimp species.

The incubation period (duration before hatching) became shorter when temperature is higher in both species, while the optimal hatching temperature was higher in *S. leurokolos* than in *A. longirostris*. Hatched larva were negatively buoyant, but normally-developed larvae could actively swim and stay suspended in the mid- or surface-water layers of the culture plates, in both species under the present experimental conditions. While no larvae settled or metamorphosed into juveniles under the present conditions, frequency of abnormal morphology was different according to temperature between the two species, i.e. the frequency was high under high temperature in *A. longirostris* and low under high temperature in *S. leurokolos*. Therefore, reproductive frequency and larval dispersal abilities of the two shrimps seemed to be differed by temperature conditions where the shrimps prefer. These results indicate that temperature is an important factor controlling life-history traits of vent shrimps.

It is widely known that temperature affect metabolic rate of animal. In addition to the present rearing conditions, several studies revealed temperature effects on ecologies of deep-sea chemosynthetic fauna including hydrothermal vent fauna. Accumulation of the information on the thermal effects on the present chemosynthetic fauna will help our understanding of ecology of fossil chemosynthetic fauna, based on temperature reconstruction.

Keywords: hydrothermal vent, Alvinocarididae, rearing experiment