# Importance of larval ecology of animals endemic to deep-sea chemosynthetic communities

# Takefumi Yorisue[1]; Shigeaki Kojima[2]; Hiromi Watanabe[3]

[1] ORI, Univ. Tokyo; [2] Ocean Res. Inst., Univ. Tokyo; [3] JAMSTEC

Deep-sea chemosynthesis-based communities are discretely distributed, unstable and relatively ephemeral environments. Therefore, long-distance migration is very important for the endemic species to survive over the duration of individual habitats. Most of them have planktonic larval stage which is the only oppotunity for dispersal as adults can't migrate long distance. Consequently, larval ecological study is important to understand dispersal ability of larvae and formational processes of such communities as well as the evolution of endemic faunal groups.

Population genetics and rearing experiments have been used to estimate dispersal processes of endemic species. Population genetics provided lots of results as it is possible to analyze based on specimens collected by a single or a few dives. In contrast, elucidation of adhesional processes is difficult due to the necessity of repeated dives and/or rearing experiment.

Long-term rearing of larvae has been reported for some chemosynthetic ecosystem-endemic animals such as vestimentiferan tubeworms Riftia pachyptila and Lamellibrachia satuma, a hydrothermal-vent crab Bathograea thrmydron, and a vent-endemic barnacle Neoverruca sp. Larvae of B. thrmydron are sensitive to light emitted from hydrothermal vents. Larvae of Neoverruca sp. shorten the larval period at high water temperature, which is thought to help larval settlement around hydrothermal vents. Farthermore, larvae of an intertidal barnacle Balanus amphitrite is known to be induced settlement by pheromones released by adults. Larvae of vent-endemic barnacles might select the habitats with tracing heat and/or pheromones. Other chemical signatures or biofilms might play an important role in the larval settlement.

Some gastropods breed fertilized eggs in egg capsules laid on the bottom. In some species, sometimes eggs develop to the late veriger stage. Capsules of Phymorhynchus gastropods were collected from the chemosynthetic ecosystems. Oenopota ogasawara is observed breeding egg capsules in aquariums under atomospheric pressure. Study of egg capsules will provide us with information of reproductive and larval ecology.

In field experiments, larvae of tubeworms and Neoverruca sp. had been shown to settle on artificial boards put on the sea floor near hydrothermal vents.

Detailed data of larval ecology will reveal how chemosysthesis-based communities are organized.