

Cruise Summary

1. Cruise Information

- 1) Cruise Number, Leg Number, RV: NT09-05, Leg 2, Natsushima
- 2) Title of the Cruise: “Hyper-Dolphin” Research Dive, Deep-sea Research, FY2009.
- 3) Chief Scientist: Koji INOUE, Associate Professor, Ocean Research Institute, The University of Tokyo.
- 4) Representatives of Science Parties, and Titles of Proposals
 - Koji INOUE, Ocean Research Institute, The University of Tokyo
 - Possible Role of a Taurine Transporter in Adaptation Mechanisms to Sulfides.
 - Hiroshi MIYAKE, Kitasato University
 - Studies on the Life Cycle of the Hydrothermal-Vent Crustaceans from the Viewpoint of Dependency on Temperature.
- 5) Cruise Period: April 10, 2009 to April 21, 2009
- 6) Port Call: Hachijo Island (Yaene) to Yokosuka (JAMSTEC)
- 7) Research Area: The Area around Myojin Knoll and Myojin-sho (Myojin Reef), and The area around Nikko Seamount
- 8) Research Map: (Fig. 1)

2. Overview of Observation

In this cruise, we had eight dives of ROV/hyper-Dolphin: one at Myojin Knoll, four (during two days) at Nikko Seamount, two (during one day) at Myojin Knoll again, and one at Myojin-sho. Scientists of two research groups joined in this cruise.

The major purpose of the Inoue group is to analyze the function of thiotaurine, a sulfur-containing amino acid, and its transporter (taurine transporter, TAUT), both of which have been suggested to be involved in detoxification and symbiosis. At Myojin Knoll, we chose some colonies of the deep-sea mussels *Bathymodiolus septemdierum*, each of which is exposed to the vent water at different degrees. Around the colonies, we also sampled the water to measure the sulfide concentration. In addition, we measured temperature and water current using a data-logger. We will use the mussels for amino acid and gene expression analyses. Some live mussels were also brought back and will be used for aquarium experiments.

The research objective of the Miyake group is to elucidate how the vent crustaceans utilize the high temperature of the vent seawater at each stage of the lifecycle. We estimated the layer structure of seawater above Nikko Seamount by observation through the Hi-Vision camera or using the CTD sensor. Then, sampling of planktonic larvae were attempted using a plankton net connected with the gate sampler, using which we could collect plankton samples of different layers separately during a single dive. In addition, we observed the distribution of Yunohana crabs using the 3D camera and the behavior of adult crabs around the vents using Hi-Vision camera, and also collected the crabs for biochemical analyses of digestive enzymes. Some live crabs were also maintained for aquarium experiments.

This cooperative cruise of the two groups offered a good opportunity to compare different types of hydrothermal vents.

NT09-05 Leg.2 Ship Track

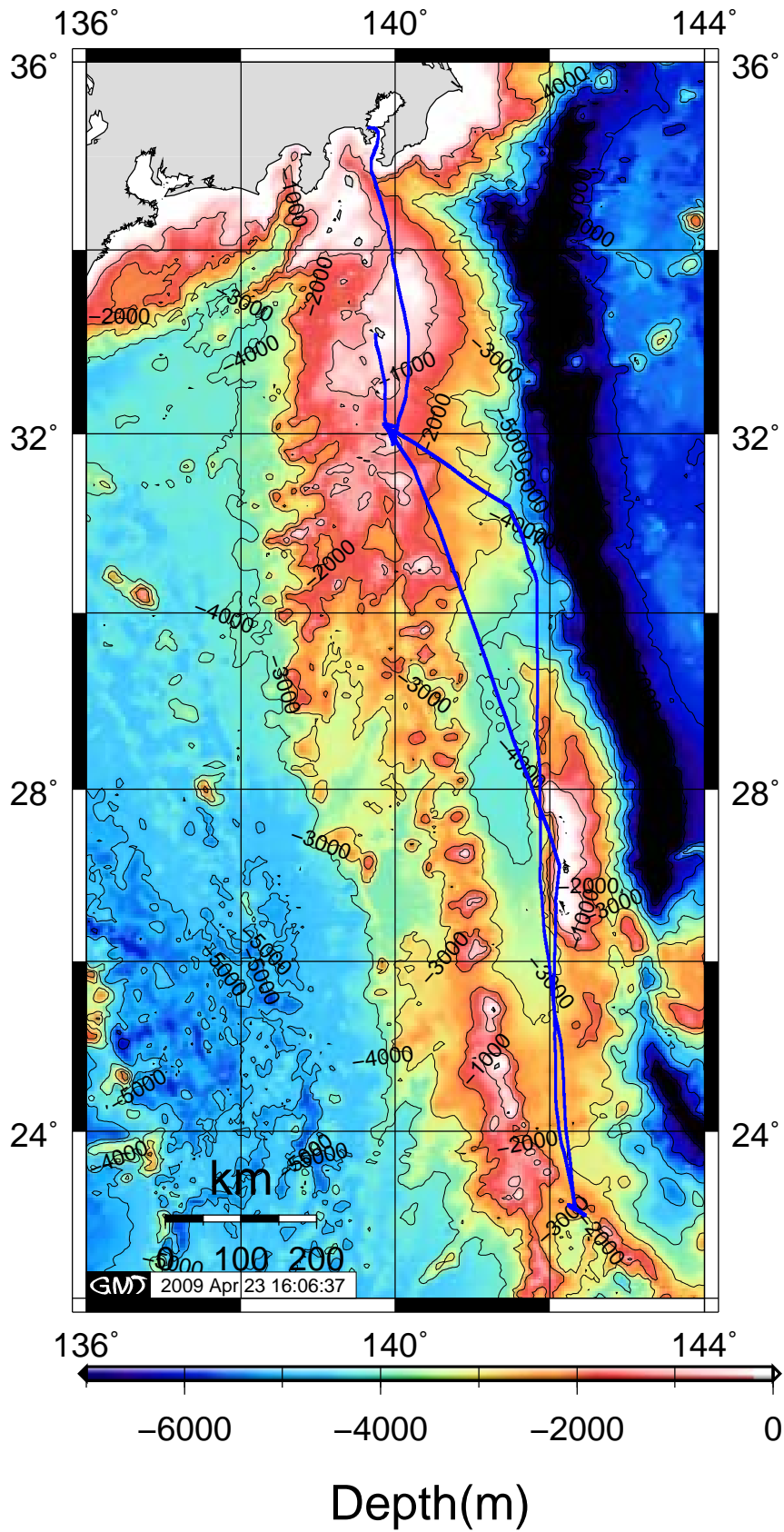


Fig.1 Track chart of NT09-05 Leg 2