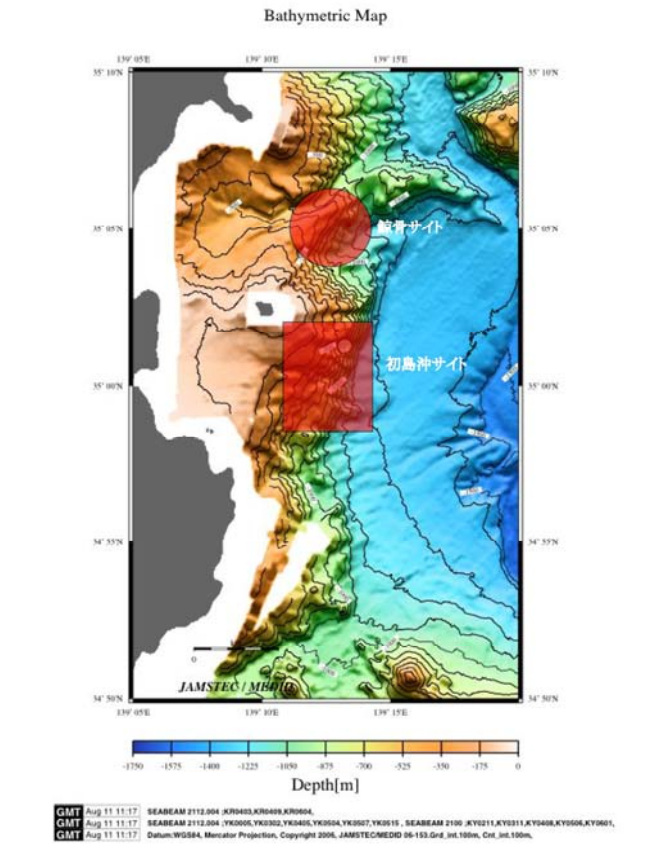
Cruse Information

Cruise number　NT08-24
Ship name　Natsushima／Hyper Dolphine
Title of the cruiseSample collection off Hatsushima, Sagami Bay
Chief Scientist
　　Mitsuru Jimbo（Kitasato University）
Representative Science Party
　　S08-41Mitsuru Jimbo（Kitasato University）
　　S08-29Takao Yoshida　　（JAMSTEC）
　　S08-63Yuichi Nogi　（JAMSTEC）
Cruise period　December, 3,2008　～　December, 12, 2008
Port call　　JAMSTEC　～　JAMSTEC

Research Area
　Off Hatsushima, Sagami Bay（Depth：800～1200 m）
34°58.0’N　　139°11.0’E ～ 35°02.0’N　　139°15.0’E
　Sagami Bay, whale site（depth：800～1200m）
the circular region which radius is 1.5 miles and which center point is 35°05.0’N　139°13.0’E.

Research Map



Overview of Observation

Proposal;

S08-41 The distribution and function of the lectin isolated from *Calyptogena okutanii*

Objective

Deep sea organisms often adopts their habits by symbiosing with other organisms. Few substances which involve to symbiosis has been known. Recently, however, it is reported that a carbohydrate binding protein called as lectin, was involved in symbiosis between legume and rhizobia, and other symbiosis. We hypoathesize that a lectin COL isolated from hemlymph of a symbiotic shell, *Calyptogena okutanii* involved to symbiosis. My objective is to examine the distribution of the lectin and symbiotic sulfer-oxidizing bacteria. also have lectins, we examine the presence of similar lectins isolated from other deep-sea organisms, like *Bathymodiolus* and tubeworm. Scince *Alaysia*, having a kind of lectin, can obtain egg and larvae, we observe the larva development, and examine the distribution of a lectin.

S08-29 Molecular mechanism of symbiosis in *Callyptogena okutanii* - sulfur oxidizing bacterium symbiosis.

Objective

The deep-sea clams belonging to the genus *Calpyogena* have vestigial digestive tracts and are nutritionally dependent on chemoautotrophic sulfur-oxidizing symbiotic bacteria, which they harbor within their gill epithelial cells. Recently, we have reported the complete genome sequence of the symbiont of *C. okutanii* (Kuwahara et al. 2007). The symbiont has genes for sulfur metabolism and inorganic carbon fixation. The symbiont is thought to synthesize amino acids, carbohydrates, and other nutrients and supply them to the host. However, no transporter for such nutrients has been found in the symbiont genome. The major purpose of this proposal is to elucidate the molecular mechanism of symbiosis between deep sea bivalve, *Calyptogerna oktanii* and chemoautotrophic intracellular bacterium. We analyze the gene expressions of gill tissue in *Calyptogena* and incorporation of inorganic carbon by isotope labeling. During the cruise, we collected seep-specific animals including deep-sea bivalves (*Calyptogena species*), deep-sea musells *(Bathymodiolus* species) mainly using a suction sampler and manipulators. For the expression analysises, the samples is dissected and frozen for molecular and biochemical analyses. For the isotope labeling experiment, C14 labelled substance is injected into *Calyptogena* and incubated. After incubation, *Calyptogena* is dissected and frozen for the isotope labeling.

S08-63 Microbial succession, multiparametrical study and isolate the useful microorganism on the whale carcass ecosystems.

Objective

It is necessary to continuously observed two points where the condition is different to understand the whale carcass ecosystems. The whale carcass ecosystems off Nomamisaki, Kagoshima, Japan, has been investigated for five years or more. There is a necessity for continuously surveying the whale carcass ecosystems in the Sagami bay as the comparison data. The whale carcass ecosystems in the Sagami bay is a place where the whale remains that washed to Atami City in April, 2005 were sunk. Then, it has started the research and the investigation since January, 2006. A large-scale animal of the crab etc. ate whale's soft tissue at the early stage. The Osedax presumed to be a new species from the gene analysis etc. is observed to adhere all over by the costal part made a bleached white bone.

These observation and sampling are done, to confirm the transition of the whale carcass ecosystems afterwards and the change in the microorganism community. The living thing observation, the microorganism diversity analysis, and the transition of microbiofacies of the whale carcass ecosystems in the Sagami bay, is examined as a main goal. Moreover, the samples take from the nearby cold-seep site, and the correlation with the whale bone microbiofacies is examined. The second purpose, isolation of microorganism that symbiosis or adheres to living thing of whale bone, isolation of useful microorganism that resolves chitin, cellulose, and polylactic acid, etc. on whale carcass ecosystems and cold-seep site. A new microorganism such as the difficult culture microorganisms is isolated.

Activities

1. Organism and geographic research by using video camera and steal camera.
2. organism sampling such as tube worms, shells and fishes, and water, core sampling.
3. pressure experiment of shells with Deep Aquarium
4. environmental measurement of CTD, and *in situ* ATP.analyser
5. Observation of whale bones and sliced bolt, and setting and recovery of a part of them.

Research results

1. Discovery of new community of *Bachymodiolus* sp.
2. Organism collection of tube worms, mollusks, and fishes
3. *Calyptogena* sp. collected were applied pressure on, then fixed.
4. Integrated *in situ* ATP analyser were tested and data were collected.
5. In whale fall, Oseodax and mussels with symbionts were observed on the whale bones. A piece of bone were collected.