

## Euryhaline halophilic bacteria in Suiyo Seamount hydrothermal area

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The euryhaline halophilic microorganisms are microorganisms which grow in a wide range of salt concentration from the low (less than 3% NaCl) to the high (more than 15%). Most of these microorganisms are moderately halophilic microorganisms, which are necessarily comfortable in high salt concentrations. And, when it is just expressed with the halophilic microorganism, it often means the extremely halophilic microorganism that can't grow at less than 5% NaCl. Euryhaline halophilic microorganisms are distinguished from extremely halophilic microorganisms. Euryhaline halophilic microorganisms are found in wide range of habitats extending from oceanic and terrestrial habitats to deep-sea and Antarctic ice sheet.

The euryhaline halophilic microorganisms are thought to keep osmotic balance in the cells by the compatible solutes such as ectoine. These compatible solutes are strong water structure formers, and are probably excluded from the hydration shell of proteins. They stabilize proteins by preventing unfolding caused by heating, freezing, or drying (Galinski, 1995).

The euryhaline halophilic microorganisms were studied in several deep-sea hydrothermal areas (Kaye & Baross 2000). We isolated four euryhaline halophilic bacteria from high-temperature hydrothermal fluids at the TAG hydrothermal mound in the Mid-Atlantic Ridge. These bacteria were related to those of isolated from other area such as Antarctica (Okamoto et al. 2001). The sub-seafloor structure of a hydrothermal vent is highly complicated system with mosaic heterogeneity of physico-chemical parameters such as temperature and salinity, and, we thought that a part of adapted euryhaline halophilic microorganisms was involved in the fluid and flow out.

We investigated the existence of euryhaline halophilic microorganisms at the underground thermal system of the Suiyo Seamount deep-sea hydrothermal vents. The drilled core samples, APSK-02, 03, 07, each of these cores was roughly crushed before using for microbiological study, and the trapped samples that obtained by in situ fluid filtration system in the casing pipe of the drilling, were used for this study. For culture of euryhaline halophilic microorganisms, we use the heterotrophic bacterial medium (seawater base) with 11.5% of NaCl. One ml of each samples was inoculated in both aerobic and anaerobic culture mediums, at room temperature.

Three samples indicated the aerobic growth. We obtained 2 of euryhaline halophilic strains from APSK-02 sec2, 1 from APSK-07 sec3, 2 from trapped sample at APSK-01. These strains were identified by 16S rDNA analysis. The strains isolated from APSK-07 sec3 and trapped sample at APSK-01 were related to *Halomonas meridiana*. The strain isolated from only trapped sample was related to *Halomonas variabilis*. Genus *Halomonas* is distributed all around the world even underground of the hydrothermal area.

The APSK-02 core samples were obtained from cold seafloor near the hydrothermal vent, and used as a control. Two strains related to *Marinobacter* were isolated from APSK-02 core samples. We also could culture halophiles that grow at 20% salt concentration and 90 degree C, from the same cold hydrothermal vent habitat. We are going to isolate and characterize these hyperthermophilic halophiles. This sample may be keeping the mosaic heterogeneity of microbial community at the active hydrothermal vent even after cooling it.

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