

## Microbial community in the seafloor around the hydrothermal system at the Southern Mariana Trough

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The ecosystem around hydrothermal system is supported by reducing compounds provided by the hydrothermal system. There is a substantial body of research results on hydrothermal areas. However, such studies have focused mainly on natural vents, chimneys and bacterial mats. These studies have suggested the presence of a sub-surface microbial community. Our study aimed at extending the current knowledge on the sub-surface community by analyzing hydrothermal fluid collected from drilled holes bored around hydrothermal areas.

The Southern Mariana Trough located where the Mariana Trench turns from north-south to east-west. In this area, back-arc spreading occurs near the island arc volcanic row. The hydrothermal systems were found around the spreading center in May 2003 (Fryer site) and at the top of the seamount located far from the south spreading center (Pika site). In January 2004, we carried out sub-seafloor drilling with BMS (Benthic Multi-coring System) at these two hydrothermal areas. Inside a wall of the drilled holes were supported by the titanium pipes. Microbial samples were collected at the Southern Mariana Trough during the TN167 cruise (15 to 27 March 2004) of R/V Thomas G. Thompson with the remotely operated vehicle (ROV) ROPOS.

The hydrothermal fluid eluted from the titanium pipes were collected and filtrated. DNA was extracted from the filters. 16S rDNA sequences were amplified by PCR with universal or archaea-specific primers. The rDNA fragments were cloned and the sequences were determined. Phylogenetic analysis of the partial 16S rDNA showed that the PCR clones from hydrothermal fluids was significantly different from those found in the ambient seawater. The detection of sulfur-oxidizing autotrophs and organotrophs suggests the ecosystems depending on the primary producers using reduced-sulfur compounds in the seafloor around the hydrothermal systems at the Southern Mariana Trough. Many bacterial rDNA clones clustered in the novel subdivision of the phylum Proteobacteria. However, the physiological characteristics of this group is not known because no cultured species belongs to this group. Detection of many clones in this group suggests that this group dominates in the seafloor at the Southern Mariana Trough.