Archaeal Community in the Hydrothermal System at Suiyo Seamount on the Izu-Ogasawara Arc.

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Microbial community in hydrothermal area at seafloor has been analyzed by culture-independent methods. Hydrothermal fluid from natural vents and vent chimneys have been analyzed by PCR (Takai et al. 1999, 2001; Summit et al. 2001; Wery et al. 2002). They contain varieties of microbes including hyperthermophilic Bacteria and Archaea. Hyperthermophilic microbes have been isolated from these environments. Though the analysis of these samples can provide the window to penetrate the microbial community under the seafloor, more direct analysis is desired for better understanding of the sub-seafloor microbial community.

In the Archaean Park Project supported by Special Coordination Fund, several holes were bored and cased in the crater of the Suiyo seamount on the Izu-Ogasawara arc, Japan (about 1,400 m depth) in 2001 and 2002. Hydrothermal fluids were sampled at various sites of cased hole at Suiyo seamount. The fluids were filtered to collect the microbial cells. The DNA was extracted used to amplify archaeal 16S rDNA fragments by PCR using an archaea specific primer set. The PCR fragments were cloned and sequenced. Archaeal PCR clone analysis of the communities of sub-seafloor showed different spectrum from that of black smoker chimneys. Archaeal PCR clones obtained from sub-seafloor belonged to the order Archaeoglobales and the clones related to the order Methanococcales. These clones reflect the hydrogen dependent chemolithoautotrophic archaea community. However, fluorescent in situ hybridization analysis showed that an archaeal population in hydrothermal fluid from sub-seafloor at the site on Suiyo seamount was low.