Cruise Summary

1. Cruise Information

● Cruise ID　KY15-07

● Name of vessel　RV/Kaiyo

● Title of the cruise　Researches on benthic ecosystem around undersea calderas

● Chief scientist　Koji INOUE [University of Tokyo]

● Representative of the Science Party　(1) Koji INOUE [University of Tokyo],
(2) Satoshi MITSUNOBU [University of Shizuoka]

○ Title of proposal　(1) Mechanisms of attachment and detachment of hydrothermal vent mussels
(2) Time-resolved in situ colonization experiments with the basalt rock for understanding a deep biosphere ecosystem in oceanic crust

● Cruise period　24–29 April, 2015

● Ports of departure / call / arrival　Yokosuka (JAMSTEC) / none / Yokosuka (JAMSTEC)

● Research area　Izu-Ogasawara Arc (Myojin Knoll and Bayonnaise knoll)

２. Overview of the Observation

(1) To elucidate the mechanisms of attachment and relocation of deep-sea mussels, we had planned to visit several hydrothermal vent sites in Myojin Knoll and perform sulfide and temperature measurement around mussel (*Bathymodiolus septemdierum*) colonies, observation of the behavior of mussels after removal of some individuals from a mussel colony as well as that after change of the course of vent fluid flow by setting covers on hydrothermal vents. However, due to strong current (Kuroshio) at Myojin Knoll, it was difficult even to settle the ROV to the bottom. During the two days assigned for our proposal, we could settle the ROV on only one vent site, where sulfide and temperature measurement, mussel collection and set of a cover, were performed but we could not observe mussel behavior at all. We will analyze environmental data obtained, and we seek next opportunity to complete our plan.

(2) Our main objective is to understand a litho-biosphere ecosystem beneath sea-floor supported by oxidation of ferrous iron in ocean crust, basalt. Accordingly, we perform “time-resolved *in situ* colonization experiment with fresh basalt” to investigate biological alteration process of the basalt rock and microbial community related to the alteration. In this cruise, we recovered the colonization vessels installed in hydrothermal area in Bayonnaise knoll in KY14-06 cruise, and also installed new vessels at same area. Seawater and sediment samples near the setting points were also collected to understand chemical conditions of colonization. As the future works, we examine microbial community and chemical species of iron in the recovered samples to reveal the mechanism on microbial basaltic iron oxidation.