

Community Structure around Hydrothermal Vents and Its Relation with Hydrothermal Fluid Features

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Life requires an energy gradient to thrive; sunlight is the dominant source of that gradient for surface of the Earth. Sunlight could not penetrate below 200 m of ocean, so it has been thought that there is no life on seafloor for a long time. Although there is no sunlight at 2000 m depth, a diverse community with high biomass could thrive around hydrothermal vents. That ecosystem also supports presence of complex macrofauna taxa. Food web of this ecosystem is started by chemosynthetic organisms. Chemosynthetic bacteria also form symbiotic relationships with animals. Energy gradient required for primary production is provided by chemical non-equilibrium and redox potential created by hydrothermal fluid. Molecular mechanisms of chemosynthesis and symbiosis between organisms are important sources for research on evolution of life at that extreme conditions.

9N East Pacific Rise is a fast spreading center with high hydrothermal activity. Geological, chemical and biological properties of the region attract scientists since the 1980s. Biogeochemistry and ecosystem of the region has been monitored continuously for long time. Our team went to the site on April 2017, 12 years after last volcanic eruption. We conducted survey on seafloor by visual observations and sampling. Succession of community is clearly seen by comparison of our observations with previous reports. Measurements done by electrochemical sensors and temperature samples suggests a relationship between properties of hydrothermal flux and community structure. Environmental DNA samples were taken from different sites to elucidate community structure by molecular methods, also tissue samples from dominant tubeworms (*Riftia pachyptila*) were taken to reveal population structure and phylogeny of the species.