The latest updates from 9˚50' N East Pacific rise hydrothermal vent communities: Beginning of the end is starting

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Hydrothermal vents provide important habitats for deep sea life by chemical energy gradient created by hydrothermal fluid flux. Free living or symbiotic chemoautotrophic microorganisms utilize redox potential in these fluxes and produce organic matter which is the starting point of an unexpectedly productive food web. Features and composition of hydrothermal fluids affect community structure directly due to different adaptation levels of species to the conditions, and energy requirements of the organisms. Because of high tectonic and volcanic activity in hydrothermal vent areas; physical and chemical properties of hydrothermal fluids changes in short time periods, especially in fast spreading areas. These changes cause change in community structure. Cycles of successions observed in fast spreading centers which start by volcanic eruption, species adapted to hot and H_2S rich fluid flux start to invade new hydrothermal sources. Subsequently, because of cooling and decrease in H_2S concentrations, dominant species in communities' change, in the end of cycle fluxes stop due to increasing distance to magma, and food web collapse due to lack of driving chemical energy.

9˚50' East Pacific Rise is a fast spreading ridge center with high hydrothermal activity. Geological, chemical and biological properties of the region attract scientists' attention since the 1980s. Biogeochemistry and ecosystem of the region has been monitored repeatedly for long time. Our team went to the site on April 2017, 12 years after last volcanic eruption. We conducted survey on vent communities by evaluation of camera records and taking environmental DNA samples. Physical and chemical properties of hydrothermal flux measured *in situ* by using electrochemical sensors. Our observations show that while free living chemoautotrophic microorganism and *Alvinella Pompejena* involving communities observed around hot and H_2S rich fluxes, *Riftia pachyptila* dominated communities are thriving around the moderate level fluid fluxes; low H_2S concentration and lower temparature favors *Bathymodiolus thermophilus* dominated communities. Comparison of community structure with previous observations of previous years shows the presence of succession in community clearly, and our findings show that after 12 years from the last eruption succession cycle comes to the end phase.

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