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Vent and seep fauna around Japan: Similarity and dissimilarity

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More than 50 chemosynthesis-based biological communities have been discovered around Japan so far. These communities are associated with hydrothermal vents, methane seeps, and whale falls. In this presentation, we will summarize the similarities and dissimilarities between the biological communities associated with hydrothermal vents and methane seeps, as most chemicals which are contained in venting/seeping flow are provided from subsurface seafloor.

The hydrothermal vent fields in the world are classified in 6 biogeographical areas based on the faunal compositions at vent fields. Japan is placed in the Western Pacific biogeographical area which is dominated by arc-backarc hydrothermal vent systems. Around Japan, vents and seeps are located close to each other as there are plate boundaries of four continental and oceanic plates.

The similarity analyses of the species composition of the animal assemblages showed that some vent communities are more similar to some seep communities than the other vent communities.

This result suggests that the faunal composition may not be much different to distinguish vent and seep. While most of the vent fields are distributed offshore, some of them, i. e. those in the Okinawa Trough, are distributed in continental margin in the Western Pacific. The faunal composition associating these vent fields may become similar to those in seep areas which are hosted by sediments. On the other hand, estimates of genetic diversity are relatively higher in the communities in vent fields. This result suggests that physiological and ecological characteristics of the animals, such as metabolic rate and number of individuals, may be different between vents and seeps.

Keywords: hydrocarbon seep, hydrothermal vent, chemosynthesis-based ecosystem, community structure