

Across-axis transition of deep-sea hydrothermal vent fauna in southern Mariana Trough

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Dispersal is an important event to sustain metapopulations in ephemeral and patchily distributed environments such as deep-sea hydrothermal vent fields. Most hydrothermal ventfields are distributed along spreading axes, and across-axis dispersal of vent fauna is little known. In the present study, phase transition of hydrothermal benthic communities was observed and dispersal inferred among three hydrothermal vent fields, the on-axis Snail site, the off-axis Pika and Urashima sites and the Archaeal site in between, across axis in the Southern Mariana Trough. Size frequencies of *Austinograea williamsi*, *Chorocaris vandoverae* and *Alviniconcha hessleri* showed that populations in the Snail site were the largest among three sites. However, genetic diversities of local populations of *Al. hessleri*, *C. vandoverae* and *Neoverruca brachylepadoformis* were the highest in the Pika and Urashima sites, although no significant genetic subdivision was detected among the populations in all the examined species. Tidal analysis of a current meter deployed near Snail site supports the possibility for planktonic larval dispersal from on- to off-axis. These results suggested the possibility for across-axis larval dispersal which promotes on- to off-axis transition of benthic fauna in hydrothermal vent fields.

Keywords: Backarc basin, Biodiversity, Genetic diversity, Planktonic larval dispersal