Geophysical Research Abstracts, Vol. 8, 10898, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10898

"Meiovent": Community study of hydrothermal vent meiobenthos associated with megafauna aggregations from the East Pacific Rise vents and adjacent off-axis sediments

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Deep-sea hydrothermal vent habitats occur along the mid-ocean ridges around the globe. They are highly dynamic and include high temperature and diffuse flow areas. Studies on mega- and macrobenthos have found that a variety of mechanisms can differentially influence community structure along a gradient of hydrothermal fluid flux. Quantitative ecological studies on deep-sea hydrothermal vent meiobenthos (animals and protists passing through a sieve with 1 mm mesh size and retained on a 63 μm mesh sized sieve) are all but lacking, although the importance of meiofauna with their crucial role in remineralization processes, their short generations times, and their quick response to environmental changes, are well recognized. The objective of this study was to identify, quantify, and compare the meiobenthic communities associated with tubeworm and mussel aggregations from some East Pacific Rise (EPR) hydrothermal vents.

Three hard substrate communities are compared. Buckfield (11^0N) site was dominated by the mussel *Bathymodiolus thermophilus*, and the two sites Riftia Field and Tica (9^0N) were dominated by the giant tubeworm *Riftia pachyptila*. The maximum temperatures were much lower at the mussel-dominated site, and the temperature to

sulfide ratio was significantly different between the tubeworm-dominated sites. All meiobenthic communities were characterized by low abundance ($<$1 to 61 ind. 10 cm^{-2}) with the exception of one sample from a tubeworm aggregation that showed abundances similar to that usually found in shallow water sediments ($\sim$1000 ind. 10 cm^{-2}). At the tubeworm aggregations, the abundance of meiobenthos was correlated to the amount of sediment accumulated between the animals´ tubes. The most abundant taxa included generalistic nematodes and vent endemic dirivultid copepods. Ostracods, tanaidaceans, mites, plathelminthes, ciliophorans, and foraminiferans occurred to a lesser extent. A total of 45 species, most of them belonging to primary consumers which feed on detritus and bacteria, was found in the EPR samples. Meiofauna contributed up to 50% to the total species richness (meio- and macrofauna) of the hydrothermal vent communities. While 19 meiobenthic species occurred in both tubeworm habitats, only 7 species were found at all three sites. Species diversity was low at the moderate flow mussel bed site, but even lower at the two tubeworm sites. The lowest Shannon-Wiener diversity indices were found at the tubeworm site exhibiting the highest sulfide concentrations. We conclude from the limited data set studied so far, that the meiofauna species diversity might be inversely related to exposure to vent fluid. Future studies will have to aim at testing this hypothesis.