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Biogeosciences Discussions

Interactive comment on "Hydrothermal activity lowers trophic diversity in Antarctic sedimented hydrothermal vents" *by* James B. Bell et al.

Anonymous Referee #1

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This paper reports the food ecology of macrofauna and possible food source, that is microbial communities in the sediments obtained from hydrothermal and non-hydrothermal areas in Southern Ocean based on CNS isotope compositions and molecular phylogenetic and PLFA analyses. This study is a sequel to the previous paper about macrofaunal ecology of the same area written by the same authors. The conclusions led by the analytical results are almost adequate, but the discussion is quite lengthy and is not straightforward. It can be shortened and simplified.

Individual points to be improved

P14 lines 297-304: I can not find any associated tables and figures mentioned in the texts.

P17 lines 358-362: What is the "four clusters"? And which figures and tables are related to this paragraph?

Food ecology of siboglinid species (chemosynthesis-based or not) must be discussed before the section 4.1 (difference of microbial assemblages and those biomass among each site). And this discussion is related to the hypothesis 1, right?

P21 lines 444-445: Long chain fatty acids originated in land plants are derived as form of triglyceride (wax). They are not PLFA.

P24 lines 545-546: S. consortium endosymbiont use only DIC in pore fluid? I think the symbiont use mainly DIC in bottom water. Because the siboglinid worm is not infauna, right?

P25 lines 548-: The previous studies (Klinkhammer et al., 2001, Aquilina et al., 2013) indicated presence of hydrogen sulfide in the sediments. The H2S concentrations were increasing with depth and sulfate concentrations in the pore fluids were decreasing with depth. It possibly suggests that active microbial sulfate reduction is occurred below seafloor. Therefore, very low sulfur isotopic signature of the siboglinid worms mainly associated with microbial sulfide. Mineral sulfide dissolution is not necessary (but hydrothermal fluid input can not be ignored).

P26 lines 585-587: If the siboglinid worms harbored thioautotrophic endosymbiont, sulfur isotopic ratios of the worm reflect the ratio of hydrogen sulfide. Therefore, the difference of 6 ‰ is meaningless.

P27 line 610: "Salp samples were also lighter than. . .", what is lighter? Carbon isotopic ratio?

P28 lines 633-635: The sediment samples using this study were not removed pore fluids sulfate before analysis. So the sulfur isotope data include 34S rich sulfate originated in pore fluid. In addition, organic sulfur originated in photosynthetic organic matter, which also enriched in 34S, is main component of the sedimentary sulfur. Possible

another sulfur source in the sediment is bacterial and/or hydrothermal sulfide (mainly form of pyrite). Why you mentioned only sulfide oxidation?

P30 lines 686-687: methane is not contained nitrogen. Lowest d15N values can not explain only methane.

Other minor points The term “vent” means an opening that allows gas or liquid to pass out. This study is not discussed hydrothermal vent, but hydrothermal activity (it include venting and shimmering and any other ascending fluid). So, I think the author change the term “vent” into “activity” or “system (or area)”.

P2 line 20: “among the least studied..” change to “one of the least studied..”

P14 line 288: I can not find “Flavobacteriia” in tables and figures. It should change to "Bacteroidetes”.

“Sulphate reducing bacteria” should change to “sulphate-reducing bacteria”.

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