

## ***Interactive comment on “Distribution of PAHs and the PAH-degrading bacteria in the deep-sea sediments of the high-latitude Arctic Ocean” by C. Dong et al.***

**Anonymous Referee #3**

Received and published: 12 January 2015

The manuscript has great potential with interesting results. The main objective is the role of some bacterial strains in the degradation of PAHs in situ. However, the authors should highlight the importance of this degradation in situ at low temperatures and high pressures. From the physical point of view PAHs degradation is more difficult under these environmental conditions. It is not understandable why the authors have included in the experimental design, bacterial growth at 15° and 25° C. There are many previous works that have studied the PAHs degradation at high temperatures. These results prevent us from seeing the real importance of the manuscript as the PAHs biodegradation at low temperatures and high pressures. There are very interesting data on diversity index (Shannon index) which have been barely discussed. However, other data no so important as the

C8015

presence or absence of certain bacterial strains have been deeply discussed in a very difficult way to follow the understanding. The current manuscript includes deep sediment samples (4000-2500 m) from approximately 250-400 atmospheres of pressure. However, it has not mentioned the effect of the high pressure changes that samples are submitted. It is not explained in the discussion why the top-down concept is not well used. This concept is used to refer to the degradation control of the processes.

More particular comments are: 2.8. Bacteria isolation, identification and phylogenetic analyses. Why 35 cycles for the PCR? The authors should test if that number is too low or too high to avoid amplification of not desirable DNA. 3.3 PAH degradation of PAH enrichment consortia. The first paragraph of this section should be in material and methods. 3.4 community structures of the consortia enriched with PAHs. I think there is a mistake in the figures.

---

Interactive comment on Biogeosciences Discuss., 11, 13985, 2014.

C8016