

Interactive comment on “Intact polar lipids of Thaumarchaeota and anammox bacteria as indicators of N-cycling in the Eastern Tropical North Pacific oxygen deficient zone” by M. Sollai et al.

V. Schwab

vf.schwab@uni-jena.de

Received and published: 19 May 2015

In this paper, the authors investigated the occurrence and distribution of ammonia oxidizing archaea (AOA) and anaerobic ammonia-oxidizing (anammox) bacteria in the Eastern Tropical North Pacific (ETNP) oxygen deficient zone (ODZ). The source specific biomarkers hexose-phosphohexose (HPH)-crenarchaeol and the phosphatidylcholine (PC)-monoether ladderane are used to trace changes of AOA and anammox, respectively in the water column. The occurrence of these microorganisms at different depths of the water column of a coastal and an open ocean setting is discussed. In

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the coastal setting, the AOA dominated between 25 to 35 m, whereas anammox dominated between ca. 40 to 70 m. In the open ocean setting, both organisms dominated between 90 to 110 m. This article addresses an important topic, which is a possible relationship between different ammonia-oxidizing organisms in anoxic environments and their relation to the marine nitrogen cycle. I recommend publication in Biogeosciences after the authors consider some issues below that may improve the clarity.

The discussion about possible causes, which may explain differences in the ecological niches of the AOA and anammox between both settings, is poor and not clearly structured. Maybe plots comparing the abundance/distribution of nutrients and oxygen with the specific biomarkers between both settings as in Fig. 3 would be useful. This might help to differentiate/characterize the effects of these factors on the AOA and anammox distribution between both settings. In Page 4846_upper lines, the authors suggested that different local circulation may explain such variations, whereas page 4848 line 5-10, they bring the possibility of difference source and availability of organic matter. I think all these hypotheses should be put and discussed together considering circulation, location, availability/concentration of NO₃⁻, NO₂⁻, NH₄⁺, O₂ and terrestrial organic matter input...

Small comments:

Table 1: Add NO₃⁻ concentration and concentration of the AOA and anammox biomarkers in the table. Fig.1: would be great to see the different currents in the figure.

Interactive comment on Biogeosciences Discuss., 12, 4833, 2015.