

Interactive comment on “A quest for the biological sources of the ubiquitous long chain alkyl diols in the marine realm” by Sergio Balzano et al.

Sergio Balzano et al.

sbalzano@nioz.nl

Received and published: 17 July 2018

Dear Reviewer 3. We would like to thank you for commenting our manuscript. Please find below specific answers to your comments

Sergio Balzano

Interactive comment on “A quest for the biological sources of the ubiquitous long chain alkyl diols in the marine realm” by Sergio Balzano et al.

Anonymous Referee #3 Received and published: 10 July 2018 In their manuscript “A quest for the biological sources of the ubiquitous long chain alkyl diols in the marine realm”, S. Balzano and co-authors present a detailed lipid-DNA comparison along a transect in the tropical North Atlantic for long-chain diols and their producers. Long-

C1

chain diols (LCD) have been of considerable interest to the community for a few years now, and show some potential as proxies for riverine input, upwelling, or potentially temperature. As their sources have not yet been clearly identified, it is timely to use an approach to combine molecular biology and DNA, which the authors employed in this study. Balzano and co-authors, using an in situ filtering approach, found diol concentrations as expected at this site, but were not able to detect the DNA of enough diol producers to account for the amounts of diols detected. The research presented is thorough, and the manuscript is clear. I have a few questions and comments:

Balzano et al: We thank Ref. 3 for their positive comments on our manuscript. Please find below detailed answers:

Referee #3. The title is engaging, but sounds more like a general review of the topic, and does not reflect the content at all. Rephrase this to clearly indicate the study area and the results.

Balzano et al. We will mention the area of study and the new title will be “A quest for the biological sources of long chain alkyl diols in the western tropical North Atlantic Ocean”.

Referee #3. Why was this specific study area selected, what makes it useful for the research question?

Balzano et al. We selected samples from the HCC cruise for this study because the stations sampled include two groups of off-shore stations (1-6 and 15-23) separated by some stations slightly affected by the Amazon River (7-13) as shown in Fig. 1. The original target of the cruise was to sample for heterocystous cyanobacteria which were known to occur in this area (see Bale et al., 2018).

Referee #3. There is a mismatch between the DNA and the diol concentrations. Could this be because of the size fraction sampled (0.7 μ m)? This is addressed (I think) by the comparison of the cell counts and the discussion in L599-606, but should be made

C2

clearer.

Balzano et al. We sampled all the eukaryotic plankton ($> 0.7 \mu\text{m}$) and used the same filter to analyse both LCDs and microbes. We do not see any bias in this approach and we believe that there are three main reasons for the mismatch between microbial community and diol distribution: (1) primer mismatch leading to real LCD-producers being undetected, (2) fossil nature LCDs and (3) undersampling of potential LCD-producers because of their very low number of rRNA gene copies. We will clarify this in the discussion.

Referee #3. The supplementary data is great and detailed, but the diol concentrations should be added in a table as well. Have the sequences been deposited in GenBank

Balzano et al. We will add the raw diol concentrations as well as the Genbank accession numbers for the sequences

Referee #3. The references are inconsistent, some contain a doi, some don't, some include the doi as a link, the citation for ODV is not correct.

Balzano et al. We will make sure all the references will be correct in the next version of the manuscript

Referee #3 L182-183: The temperature regime is a very minor detail to add, so for the sake of the reader who wants to reproduce this, I would add this to the section.

Balzano et al. The temperatures of the sampling points analysed here are also shown in Fig. 1A.

Referee #3. L277-297: Is this new data or has this been published by Bale et al. 2017?

Balzano et al. Some of these data are also published in Bale et al. (2018), since both manuscripts are referring to samples collected during the same cruise. We will clarify in the manuscript which data are from Bale et al. (2018) and which once are published here for the first time.

C3

Referee #3 Table 2: Is that % abundance or actual concentrations?

Balzano et al. Table 1 refers to the number of rRNA gene reads from different taxa as well as their percentage contribution to the total rRNA gene reads. We will clarify this in the legend. Table 2 and Table 3 show instead Spearman correlation values.

Referee #3. Figure 1&2: Considering the two-dimensional nature of the transect, a supplementary online 3D plot could be useful.

Balzano et al. We believe that Fig. 1 and Fig. 2 show sufficient information on the physical parameters and the LCD concentrations on the samples analyses.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2018-97>, 2018.

C4