



Interactive comment on “Bacterial carbon sources in coastal sediments: a review based on stable isotope data of biomarkers” by S. Bouillon and H. T. S. Boschker

Anonymous Referee #2

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This manuscript provides a review of the $\delta^{13}\text{C}$ content of bacterial iso and anteiso C_{15} PLFA ($\delta^{13}\text{C}_{i+a15:0}$) and $\delta^{13}\text{C}_{\text{TOC}}$ in sediments from a range of coastal systems. The goal of the study was to characterize the variance in $\delta^{13}\text{C}_{i+a15:0}$ across coastal environments. An additional goal was to examine the relationship between $\delta^{13}\text{C}_{i+a15:0}$ and $\delta^{13}\text{C}_{\text{TOC}}$ in order to evaluate the sources of carbon supporting sediment bacterial production.

Overall, this manuscript is a solid contribution and ultimately it is worthy of publication. However, there are several places where additional information is needed. For example, there is no description of the methods used for data analysis and in general, data (statistical) analysis is lacking. On page 1622 (line 5), the authors describe their study as a “meta-analysis”, yet it is unclear whether an actual meta analysis was

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done. A meta-analysis is the statistical analysis of a collection of individual studies. In its present form, no description of any statistical analyses is presented. In addition, if a meta-analysis was conducted, information about the software used, how data were weighted, what metrics were used for the weighting, etc. should be provided.

There are other examples where data analysis is needed to support the interpretations. For example, the authors note “a good overall relationship between $\delta^{13}\text{C}_{\text{TOC}}$ and sediment TOC levels” for mangrove and saltmarsh systems (Page 1625, Line 6-7). Later (page 1626, line 6), the authors noted that “clear relationships between %TOC and $\delta^{13}\text{C}_{\text{TOC}}$ were not evident for seagrass and unvegetated systems. However, in both cases, neither r^2 values nor correlation coefficients were presented to support these statements. To clarify the evidence the authors are using as the basis for such statements, I recommend that a table be added where the r^2 values or correlation coefficients for the relationship between $\delta^{13}\text{C}_{\text{TOC}}$ and sediment TOC levels are presented for each of the sub-habitats studied.

A second concern I have is that $\text{C}_{15:0}$ FA is not present in all bacteria, and tends to be more abundant in sulfate reducing bacteria (see Kaneda, 1991, Microbiological Reviews, p.288-302). However, not all sulfate reducing bacteria synthesize this fatty acid. Thus, at best, these compounds represent a subset of the sediment microbial community. It is important that the authors clarify this to the readers because this could contribute to the wide range of isotopic values. It would also be interesting to know whether the isotopic signature of $\text{C}_{15:0}$ FA was similar to other PLFA and if so, what compounds. This could provide insights about whether the $\text{C}_{15:0}$ FA results represent the larger sediment bacterial community.

Page 1630. Line 28. While microphytobenthos is often isotopically enriched, it can have a wide range of stable isotope values (see Currin et al., 1995, Marine Ecol. Prog. Ser., V 121, pp 99-116).

Minor Edits Page 1618. Line 2. Revise to read, “and receive organic matter.” Page

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1626. Line 15. Revise to read, “If macrophyte material dominates the TOC pool”

Interactive comment on Biogeosciences Discussions, 2, 1617, 2005.

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2, S731–S733, 2005

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