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Biogeosciences Discussions

Interactive comment on "Paleo-environmental imprint on microbiology and biogeochemistry of coastal quaternary sediments" *by* M. Beck et al.

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We would like to thank anonymous referee #2 for appreciating our study and giving helpful comments.

Anonymous Referee #2

R2: . . .I don't think the title is translating what the authors exactly discussed in this paper, the authors present a good microbiological and geochemical data set of standard analyses from two comparative sedimentary sequences at the same tidal flat field, and hence worth reporting in Biogeosciences.

Reply: We have changed the title to: "Imprint of past and present environmental conditions on microbiology and biogeochemistry of coastal Quaternary sediments".

Specific comments: R2: p. 5465, line 24: “5 ms below the sea floor” should be “5 meters below the seafloor”.

Reply: Changed as suggested.

R2: p. 5475, line 24: “the very early diagenetic sulfur cycle was responsible for sulfide retention”. It seems to me somewhat important aspects in this study. Please provide a bit more explanations/ discussions in this regard. Why neither sulfide nor AVS/CRS was detected from the lower AOM zone at JS-1?

Reply: From the covariation of lithology, TOC and CRS contents we can clearly identify the control of the very early sulfur cycle that is associated with available organic matter and reactive iron for the retention of sulfide: enhanced pyrite contents are observed in layers with high mud and TOC contents. This is in agreement with control of SRR by TOC and the sulfide retention by availability of reactive iron. We can only speculate about the fate of AVS/H2S at the lower AOM zone at JS-A. When compared to the TOC contents and the lithology, it becomes evident, that this zone is associated with higher mud contents. Therefore, in association with enhanced pyrite contents in this part of the sediment core, we suggest, that sulfide produced by AOM already reacted to pyrite.

R2: Fig. 4. Can be removed, with some additional statements in the text.

Reply: We do not agree with the reviewer’s suggestion. The texture of pyrite in the sediment cores bears the information of iron sulfides produced as a consequence of microbial sulfate reduction both, close to the sediment-water interface (framboidal occurrence) and latter upon diagenesis in deeper buried sediments (euhedral single crystals). This is important to identify the place of SR-associated pyrite formation. Therefore we decided, to keep this figure in the communication.

Interactive comment on Biogeosciences Discuss., 7, 5463, 2010.