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Discussions

Interactive comment on "Impacts of biogenic polyunsaturated aldehydes on metabolism and community composition of particle-attached bacteria in coastal hypoxia" *by* Zhengchao Wu et al.

Anonymous Referee #2

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Wu et al., reported impacts of biogenic polyunsaturated aldehydes on metabolism and community composition of particle-attached bacteria in coastal hypoxia. I think the manuscript is interesting, in particularly aiming at providing a biological mechanism underlying estuarine seasonal hypoxia. However, there appeared to be some problems about the experimental design of this study and the manuscript fails to provide convincing results. More details about the motivation and experiment procedure should be included and clarified and the conclusions should be carefully justified. 1. My major concerns about this manuscript is that the authors consider PAB as bacteria attached

to particles with a size >25 μm in the microcosm incubation. A great variety of bacteria would be lost, which would affect the major conclusion of the manuscript. The abundance of bacteria attached to >25-μm particles would be significantly lower than that of free-living bacteria. Also, is this particle size proper for measurement of polyunsaturated aldehydes? In addition, it is not clear why the authors choose 1 or 100 μmol L-1 but not the background value for the incubation. Moreover, bacterial community of the initial inoculates was lacking. Personally, the most interesting part of this study is the role of polyunsaturated aldehydes-enhanced bacterial oxygen demand for the seasonal hypoxia. Thus, it is important to know to what extent different concentration of polyunsaturated aldehydes affect bacterial growth and respiration. Although the authors provide discussion on this, more analyses including the selection of background concentration of polyunsaturated aldehydes and testing on pure isolates are needed. 2. It is unclear why the authors studied the effect of polyunsaturated aldehydes of bacterial communities. The importance of polyunsaturated aldehydes was not properly and clearly presented. For examples, although the authors mentioned the effect of polyunsaturated aldehyde on marine microorganisms, detailed processes and mechanisms are not provided. Line 43: Please provide reference for the higher abundance of PAB compared to FLB. Line 59-60: How polyunsaturated aldehyde affects marine microorganisms? Please provide more details. Line 63: What is the meaning of affect oxygen depletion? Is this a promoting or inhibiting process? Line 72-73: It is strange to place this sentence here. Why PUAs did not serve as carbon source? Line 81: Is that "July 2nd"? Line 88: what do you mean by "pPUAs and dPUAs"? Line 265: I did see description of methods about the bacterial community analysis in bottom waters of X1,X2, X3 and PAB on particles of >25 ïA■m. Line 276: Please provide the concentration of pPUAs and dPUAs. Line 278: shown Line 391: According to the results, low dose (1 μmol) of PUAs can stimulate the growth of PAB, significantly different from that of high dose (100 μmol) treatment. However, the test of PUAs as organic carbon source was conducted with 200 μmol of PUAs. I guess such a high concentration would adversely affect bacteria growth, while the low dose PUAs is likely to be used as organic sources.

Line 686: data of panel D are reproduced from Ribalet et al., 2008. Is this panel E? No methods were provided for growth of Alteromonas hispanica MOLA151. Line 448: Since bacteria on >25-μm particles can be low, hypothesis on signaling molecules may be tuned down.

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