

In the latest iteration of this manuscript by Vigderovich et al., the authors put considerable effort to the language, flow, and clarity through the whole document. The methods are much easier to follow and are much more reproducible. The results are properly reported and discussed. However, I have only one minor comment which I will point to below. Otherwise, the remaining minor comments and edits are rather small and mostly cosmetic (see inline comments).

Minor comment:

The results from the metagenomic and lipid analysis clearly show evidence of aerobic methane oxidizing bacteria. The discussion does clearly state that if aerobic methane oxidizing bacteria do play a role in turning over methane in these experiments is quite low. However, the conclusion reads as if they play a much bigger role in the turnover with methane which is hugely speculative. The problem I have with this portion of the manuscript is that aerobic methane oxidizing bacteria were not directly tested in any of the experimental setups. Oxygen concentrations were not determined, and the experiments were all set up anaerobically. Thus, the incubations were not setup to directly test for aerobic oxidation of methane activity. I still think though the metagenomic and lipid findings are a real bonus dataset and are very interesting and should be investigated further. However, I do not think the results presented in this paper warrant the statement in the conclusion that aerobic methane oxidizing bacteria play a role since it wasn't directly tested. I therefore, suggest that the paper would be much stronger by really highlighting the coupling of hematite to AOM by anaerobic archaea. Following this conclusion, provide examples of how aerobic oxidation of methane by the bacteria maybe involved in Lake Kinneret sediments, but the results presented here show a need for further direct testing of this potential.

Inline comments:

Overall, the manuscript reads much better. Below are some inline edits and comments I caught while reading. It is likely I did not catch all and I suggest the authors go back and thoroughly fix minor grammatical errors.

L54-55: There are other types of aerobic methane oxidizing bacteria. This sentence reads as if there is only 1 in existence. I suggest just adding in parentheses type II and type X.

L52: get rid of "Thus"

L79: Are you saying Fe-AOM is oxidizing methane in the methanogenic zone or Fe-AOM removes methane produced from methanogenic zone in the top 20 cm?

L88: Include "conditions" after "hypoxia"

L94: Delete "are available"

L100: Add "of" before "two stages"

L127: Please add how much ¹³C-methane you added.

L137-139: This would probably read better as two sentences.

L150: Cores were sliced at what cm intervals?

L151: Please provide details on the dedicated container. Also why not directly into falcon tubes?

L149-154: I am a bit confused here. You collected cores and extracted porewater on the same day. However, porewater was extracted in the lab while core collection and slicing happened on board. Were these just day long excursions and you were able to bring the sediments back to the lab for extraction? If so I suggest making this more clear that field sampling and laboratory processing happened on the same day of collection.

L153: Syringe filtered or filter tower?

L155: Missing temperature units.

L155: Subsampled not subsamples

L162: Was the N₂ atmosphere maintained in a glove bag or continuous flushing? Please add.

L163: Please add how you homogenized the sediment.

L163: Add the word "was" between "gr" and "transferred"

L258: Add spectrophotometer model

L263-264: For ethylene determinations did you use the same column and carrier gas for these measurements? If so consider consolidating into the previous sentence with methane.

L326: How "significant" did you do statistics. I would consider removing.

L350-352: Sentence does not read well.

L352-354: The addition of what had no increasing effect to the ¹³C DIC pool? Molybdate or magnetite?

L479: How significant of a finding is this. Where are the statistics behind this claim? I would consider removing the word "significant" in the document when statistics was not done.

L485: I think the flow of the manuscript would be better to have subsections to 4.2 for each of the electron acceptors (i.e. 4.2.1 various metal oxides as electron acceptors etc...).

L603: You mention in the discussion that Aerobic methane oxidizing bacteria play a minor role in turning over methane. This was only drawn from lipid and fatty acid determinations and genomic evidence which doesn't necessarily mean they were active. Nor were any of these results connected to the ^{13}C -DIC increases seen in the experiments. I therefore, suggest to adjust this sentence to say that the exact role of aerobic methane oxidizing bacteria in Lake Kinneret sediments needs further examination. Because as is, the text reads that they are more involved than what is reported in the data.