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Biogeosciences
Discussions

Interactive comment on "Effects of copper mineralogy and methanobactin on cell growth and sMMO activity in Methylosinus trichosporium OB3b" *by* E. Chi Fru et al.

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E. Chi Fru and coauthors present in their manuscript (Effects of copper mineralogy and methanobactin on cell growth and sMMO activity in Methylosinus trichosporium OB3b) data on how the different copper minerals and methanobactin affect growth of the tested methanotroph and its soluble methane monooxygenase activity. A major novelty of the study compared with previous studies is that the authors utilized different environmental relevant copper minerals, Tenorite and Malachite, and others. Copper solubility increased when methanobactin was present. This effect was evident with

Tenorite and Malachite. M. trichosporium OB3b grew with active particulate MMO on malachite, but in Tenorite treatments immediate growth was only possible with sMMO being active, pMMO active precultures had substantial lag phases. Principially, the addition of methanobactin led to increased growth and direct cell mineral contact reduced sMMO activity.

The study has its merit in having a fresh look on the copper availability story with methanotrophs in a way that approaches by a more realistic experimental set up the situation in nature. The text needs to be improved and the readability of figures should be enhanced (details below).

The major problem with current manuscript is lacking deep reaching conclusions. Overall conclusions (page 2852, lines 23-26; page 2864; lines 10-17) are weak. For example, why does methanobactin stimulate growth of M. trichosporium OB3b on tenorite, but did not repress the copper-independent sMMO activity in presence of the copper source Tenorite. Could methanobactin be also important for iron acquisition? OR: what do you mean by 'This has implications to in situ bioremediation and other studies on methanotroph function in terrestrial systems.' What implications has your study for methanotrophs in terrestrial ecosytems, i.e., soils?

General comments

Use 'terrestrial environments' instead of 'terrestrial settings'.

Avoid phrases as for example 'Figure 2 shows. . .grew without lag phase' BETTER: '. . .grew without lag phase (Fig. 2). . .'. OR: '. . .patterns shown in Table 1.' BETTER '. . .patterns (Table 1).'

Detailed comments

Page 2852 Lines 1-26, the abstract is quite long and includes to much introductory information. Please, shorten it.

Page 2853 Lines 18-19, 'very high affinity'. Please, provide a concrete value, e.g. KM.

Page 2854 Lines 8-18, Delete this part. This is not an optimal style. The whole part is redundant with the Material and Methods section and distracts from the story.

Page 2855 Line 11, Does dissolved S2- ions may be toxic for methantrophs?

Page 2859 Lines 12-13, exchange ‘parallel’ with ‘agree with’

Page 2860 Line 4, ‘. . .and physical factors was not initially clear’ Please, rephrase it in a concrete way. Which physical factors do you mean? Line 21, replace ‘be’ with ‘have been’ Line 22, add after ‘but’ ‘should have been’

Page 2861 Line 27, ‘. . . and supplemental mb was provided to some flasks’ Which? How many? Cannot that not be clarified in Meterial and Methods section?

Page 2863 Lines 14-16, too long sentence. Two thoughts = two sentences Line 24, rephrase this statement in a concrete way.

FIGURES

Fig. 1, y-axis: remove the word ‘level’. Error bars from duplicates, at least triplicates are needed to calculate fair errors. Thus, please, remove the error bars. Values are not ‘relative values’ the shown values are corrected by controls without methanobactin.

Fig. 2, Remove the word ‘pattern’ from the legend text.

Fig. 3, Convert Panel B in a line-dot graph. It is much better readable and fits better to the temporal continuity of the data. Second last sentence in the figure legend: this is a result and should be mentioned in the text. Please, remove it from the legend text.

Interactive comment on Biogeosciences Discuss., 8, 2851, 2011.