Biogeosciences Discuss., 8, C3957–C3959, 2011
www.biogeosciences-discuss.net/8/C3957/2011/

Biogeosciences Discussions

Interactive comment on "Biogeochemical factors affecting mercury methylation rate in two contaminated floodplain soils" *by* T. Frohne et al.

A. Acquavita

alessandro.acquavita@arpa.fvg.it

Received and published: 28 October 2011

The paper entitled "Biogeochemical factors affecting mercury methylation rate in two contaminated floodplain soils" focuses on mobility and methylation of mercury species. Due to the important toxicity effects of these compounds I think that this kind of work should be greatly encouraged. The Authors applied a microcosm experiment in order to simulate and follow the effects of flooding events. These approaches have been already employed by scientific community and gave very interesting results and suggestions for further investigations in environmental matrices such as soils and sediments.

The paper of Frohne et al. is well structured and written. In addition, the experiments have been well designed and the results are completely discussed taking into account the more recent peer reviewed literature. Due to this I recommend the publication in

Biogeosciences discussions. I have only some comments that I hope useful to improve the manuscript.

1) I suggest improving the quality of the figures, especially Fig.5 and Fig. 6. In fact, within the text the concentrations of both Hg and MeHg are not discussed in terms of values, so for a potential reader, the figures are essential in order to follow the results and discussion. Moreover, I suggest to report in the text the mean concentration of Hg and MeHg found during the experiments;

2) The W1 and W2 study sites are characterized by very different Hg contents (5 and 30 mg Kg-1). Is the origin of Hg the same? W2 is in the vicinity of a source, for example a chlor-alkali plant? If you have these informations it should be better report.

3) Have you the MeHg initial contents in W1 and W2?

4) Do you have you the possibility to compare your results, obtained in dissolved phase during mesocosm, with other similar experiments? Or with value found in natural conditions (no mesocosm)?

5) In 3.2 (Redox experiment) measured parameters obtained are provided in table 2. Is this table related to both MCs experiments? I think that could be better distinguishing the variation for W1 and W2. If there are some differences between the two sites they could be better highlighted;

6) page 8938, line 17: The MeHg/Hgt ratio may also be the result of MeHg demethylation processes. Low MeHg/Hgt ratios can be due to low Hg methylation or to high MeHg demethylation rates (Remy et al., 2006). This sentence seems redundant: I suggest to report only "Low MeHg/Hgt ratios can be due to low Hg methylation or to high MeHg demethylation rates (Remy et al., 2006)"; Line 26: Furthermore, DOC can contribute to abiotic methylation of Hg by donating methyl groups (Weber, 1993). Ok, it is true. But I suggest to emphasize that abiotic methylation is a process of minor importance respect than biological one.

Interactive comment on Biogeosciences Discuss., 8, 8925, 2011.