

Interactive comment on “Wetland restoration and methanogenesis: the activity of microbial populations and competition for substrates at different temperatures” by V. Jerman et al.

Anonymous Referee #1

Received and published: 13 March 2009

General Comments Wetland restoration is a topic of environmental concern. Jerman et al. report on the effect of water saturation on soil methanogens and competing Fe(III)-reducers in microcosm experiments with drained fen soil. Such an area of research is of interest to the readers of the journal, since the effect of flooding was simulated and valuable information on (i) the competition of iron reducers and (ii) the reaction of the fen to flooding concerning methane production was obtained. However, data on the competition of methanogens and iron-reducers are not entirely new, and in situ methane fluxes of experimentally flooded areas are still needed in order to judge, whether the data of the microcosm experiments are useful proxies for predicting methane fluxes of the system. Such reference data is particularly useful if one considers fen sample storage

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and handling (see specific comments below). In any case, the authors should address this issue in the discussion.

Specific Comments P2360L12-13 Were fluxes measured of the drained fen? P2361 The samples were sieved and stored for maximal 2 weeks. During sieving and storage, soil samples were exposed to oxygen. Could such oxic conditions have caused an inactivation of methanogens and a re-oxidation of iron? Was the lag phase for methane production affected by handling and storage of fen soil? P2362L9-10 Please clarify; on the first sight, it is puzzling to read that methane oxidation was measured after adding an inhibitor for methane oxidation. P2362L25 What was the rationale of using only temperatures above 25 °C, although soil temperatures ranged from 1-20 °C (P2361L23)? P2363 Please give details of the gas chromatographic determinations or cite appropriate references. What columns, oven temperatures, gas chromatographs, flow rates of carrier gas, etc. were used? P2364 Please give position in the protocol, number and volumes of guanidine thiocyanate solution washes or appropriate reference. Please indicate manufacturer, city, country whenever needed. P2365 What PCR-chemicals were used? P2366L5-13, Fig. 6-8. Verification of tree topology is needed. E.g., the authors could apply bootstrapping (>1000) or drawing of consensus trees based on 2 additional treeing algorithms (which may be more robust than bootstrapping). P2368L21-P2369L1-5 Was the affiliation of T-RFs to certain groups (as evidenced by literature references) also supported by clone sequences retrieved from the fen soil analyzed? P2369 and Table 1. What were the similarities of DGGE band derived 16S rRNA gene sequences to the closest related organisms? Such information should be included into table 1. P2370 The discussion should take such similarities into account. Are those sequences indeed indicative of organisms with the suggested physiologies? Technical Comments P2365L10 Typo, should read “MinElute” instead of “Mini Elute”. P2369L21 Typo, should read “acetylenicus”.