

Interactive comment on “Iron encrustations on filamentous algae colonized by *Gallionella*-related bacteria in a metal-polluted freshwater stream” by J. F. Mori et al.

K. Wendt-Potthoff (Referee)

katrin.wendt-potthoff@ufz.de

Received and published: 6 July 2015

The manuscript reports on the occurrence of algae and prokaryotes with a focus on FeOB in a slightly acidic polluted stream in Germany. This is a very interesting study site for two reasons: (1) there are still fewer reports on iron cycling in mildly acidic than extremely acidic sites and (2) the study design provides gradients both in geochemistry (from site O to C) and time (July to September). The authors should more clearly mention these important aspects in the introduction and discussion. The authors apply a comprehensive set of modern methods to samples directly obtained from the field, thereby producing an impressive and novel dataset which is very well presented. The

C3357

findings are discussed in the context of a comprehensive selection of international literature. Regarding the text, the authors should again carefully check the use of present tense/past tense and singular/plural. In several places, small words like “a” or “in” are missing.

Specific comments:

P 7706 lines 24-25: misleading statement, as production of the EPS by algae could not be proved.

P 7707 lines 10-12: better separate these statements and references and explain in a more specific way – apparently in this study the EPS production was higher in “fresh” (green) than senescent (brown) cells?

P 7708, lines 14-15: the strict chemolithotrophy of *Gallionella* in general is still under dispute, please check Spring & Kämpfer 2005 (Bergey’s Manual). As this might be considered important in the present study (organic-rich exudates of algae?), the authors should clearly explain their point of view on this.

P 7710 line 10: PVDF should be explained

P 7710 line 13: how long were samples stored?

P 7715 line 14: apparently the site O could not be reached at all. Has this something to do with the flood occurring in Germany in June 2013? Did the water level change?

P 7715 lines 21-22: *Tribonema* sp. is a genus, not a species

P 7715 lines 26 and 28: autofluorescence should be used throughout

P 7716 line 8: minerals with irregular shape or with rough appearance?

P 7716 line 15: figure 4 suggests that there was more EPS with green algae, is this true? Sentence should be revised.

P 7719 lines 1-3: it could be discussed what cause and effect is. Why not: deareas-

C3358

ing light reduces photosynthetic activity and EPS production (if produced by algae), thereby facilitating Fe precipitation, which further impedes photosynthesis (positive feedback)?

P 7719 line 28: hard to say without photosynthetic rates or microscale data. It should be discussed that Gallionella has previously found to grow and be active under fully aerated conditions (de Vet et al. 2011, Water Research).

P 7720 lines 1-3: which geochemistry parameters make the difference?

P 7720 line 17: the mechanisms presented in Schädler et al. 2009 (Geomicrobiology Journal) could also be discussed here.

P 7721 line 18 and following: in August and September, the brown algae apparently harbored more beta-proteobacteria (Figure 7). Is there any evidence that Fe(III)-reducing communities developed with time?

Interactive comment on Biogeosciences Discuss., 12, 7705, 2015.