

Authors response to editor's comments

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Title: Kinetics of calcite precipitation by ureolytic bacteria under aerobic and anaerobic conditions

Journal: Biogeochemistry

We thank the editor for her comments on our manuscript. We have revised the manuscript in accordance with reviewer responses (as addressed in our responses via the interactive review 20/03/19), and according to editor suggestions from 31/03/19. These responses to the editor's comments are shown below:

Comment 1: Pg. 5 l. 2: *S. pasteurii* (ATTC 11859) –is this ATCC?

Response: Yes, it should be ATCC. We have corrected this in the modified manuscript.

Comment 2: Pg. 5, l. 29: use TEA here since it was already abbreviated

Response: We agree with the editor and used TEA instead of terminal electron acceptor in the the revised version of the manuscript.

Comment 3: Pg. 5, l. 30-32: this reads awkwardly—you didn't make the nitrate solution from 1M NaNO₃ but the solution was 1M NaNO₃. Suggest revising to "...NO₃⁻ was added from a solution of 1M NaNO₃; ii) a concentrated SO₄²⁻ solution was made by combining 1M Na₂SO₄ and 1M Na₂S, Na₂S was added to quench any residual oxygen and make SO₄²⁻ reduction possible; and iii) Fe³⁺ was added from a stock solution of 50 mM Fe(III) citrate made as previously described."

Response: The sentence now reads: Concentrated stock solutions of each TEA were made in the anaerobic chamber and filter sterilized: i) a 1M solution of NaNO₃; ii) a concentrated SO₄²⁻ solution, made by combining 1M Na₂SO₄ and 1M Na₂S, where Na₂S was added to quench any residual oxygen and make SO₄²⁻ reduction possible; and iii) a stock solution of Fe(III) citrate, using 50 mM Fe(III) citrate as previously described (Gerlach et al., 2011).

Comment 4: Pg. 6, l. 2: do you mean anaerobic control here?

Response: No. We were referring to the comparative aerobic experiments including TEAs, as shown in Figure 4 (circles). We have corrected this in the revised version of the manuscript to read;

"Comparative aerobic control experiments were also performed with CMM- media including 10 mM NO₃⁻, SO₄²⁻, or Fe³⁺ and inoculated with 1 mL of *S. pasteurii* in 150 mL serum bottles."

Comment 5: Pg. 7, l. 16: please correct sub- and superscripts

Response: *We corrected the sub- and superscripts in the revised version of the manuscript.*

Comment 6: Pg. 13, l. 6: growth and pH seem pretty similar between the nitrate and Fe treatments. Its not clear why nitrate was preferentially chosen

Response: *We agree there are not significant differences between the different TEAs. We have therefore altered the justification in section 3.2.2. to read;*

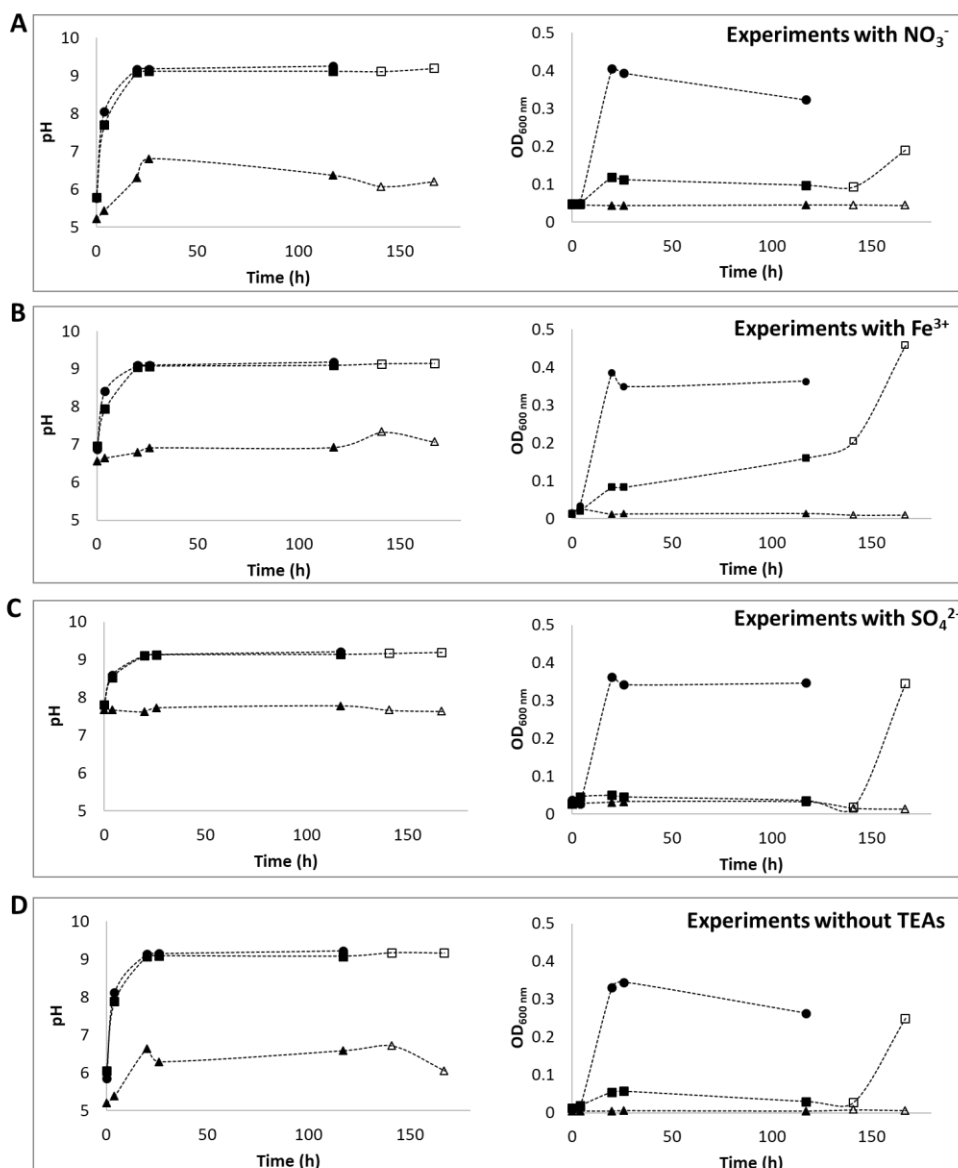
“After the screening experiments with different TEAs, studies were performed to determine the kinetics of ureolysis and CaCO_3 precipitation in the absence of oxygen. Since there were similarly low levels of growth in the initial anaerobic screening experiments with different TEAs and no TEA (Figure 4), kinetic experiments in the absence of oxygen were conducted with no TEA as well as with NO_3^- as a potential TEA (Figure 5).”

Comment 7: Pg. 14, l. 16: correct italics

Response: *The italics have been corrected in the revised version of the manuscript.*

Comment 8: Figure 4: Give abbreviation TEAs in the figure caption. There are only open data points for some panels, why? Why have OD measurements and not pH after the bottles were opened?

Response: *We included the abbreviation TEAs in the figure caption in the revised version of the manuscript. We have also modified Figure 4 and included the open data points for the pH graphs. The corrected figure has been included in the modified version of the manuscript and for reference below.*



Comment 9: Figure 5 caption: correct spelling of circle.

Response: We corrected the figure caption in the revised version of the manuscript.