

Interactive comment on “Improving the Strength of Sandy Soils via Ureolytic CaCO₃ Solidification by *Sporosarcina ureae*” by Justin Michael Whitaker et al.

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Please see supplemental PDF attached.

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Author’s Response – Review #2

(1) Comments from Referee #2

“Abstract line 30: This sentence is not entirely clear to an unfamiliar reader, suggested changes: “However, shear strength of samples following acid-rain simulations fell to 29.2% of control MICP samples.”

“Line 274 and Figure 2 a,b: Suggestion regarding the confusion around U/mL units is to simply express the rates as mol/(min-mL) throughout the MS instead of designating the parameter U. If U is used, please redefine it in Fig 2 caption, as the explanation in text was easy to miss.”

“Figure 6: Were the same tests performed on *S. pasteurii* treated samples? This data would be interesting to see alongside the *S. ureae* treated sands.”

(2) Author's Response

Dear referee,

We thank you for your time reviewing our manuscript. We have considered your changes and have now made the appropriate additions to the manuscript.

Figure 6: It is correct the data represents that of *S. ureae* only. We underwent this testing as *S. ureae* is a novel ureolytic MICP model for which the environmental durability testing reported has not been previously performed, according to our literature review. However, another ureolytic MICP model used to assess similar environmental durability parameters of ureolytic MICP was also highlighted for comparison purposes (see Cheng and Cord-Ruwisch 2013 DOI: 10.1139/cgj-2012-0023). Other model species (i.e. *S. pasteurii*) have also been tested in environmental simulations, though differently from those reported in this manuscript (see Mortensen et al., 2011 DOI: 10.1111/j.1365-2672.2011.05065.x). Based on the results of our study, combined with those of a previous study, it was found reasonable to assess that all model species (i.e. *S. ureae*, *S. pasteurii*, etc.) in ureolytic MICP would have similar physical outcomes under the environmental simulations performed (i.e. acid-rain degradation). Thus, no further testing on other model species was done.

For your convenience, we have highlighted the sections in the manuscript in yellow which we feel best provide rationale for the above.

We do welcome any further comments regarding how we may make the manuscript

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stronger and, specifically, if the above rationale can be made more clearly in the current manuscript.

Thank you again for your time and kind efforts in review.

(3) Author's Changes in Manuscript

Line 30 (Abstract): Sentence in changed to match that suggested by referee.

Line 334 (Figure 2): U/mL defined in caption as : $U/mL = \text{mol of } NH_3-NH_4^+ / \text{minute-mL culture}$

Line 99-101 ; 644-645 ; 654-657 : Highlighted text in explanation of Figure 6.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2017-517/bg-2017-517-AC2-supplement.pdf>

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2017-517>, 2018.

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