

## ***Interactive comment on “Relation of aggregate stability and microbial diversity in an incubated sandy soil” by F. Büks et al.***

### **Anonymous Referee #2**

Received and published: 6 April 2016

General comments The authors intend to analyze the effects of microbial diversity on the formation and stability of aggregates in a sandy soil admixed with 5 vol

Some details: Title The title did not completely meet the content of the paper: Most of the discussion focusses on the effects of inoculation on soil microbial diversity and its possible effects on net and cumulative SOC release (may be used as a measure for aggregate stability, however a reference is missing). Additionally the manuscript focused on a mixture of soil plus 5volMay be the statement at L137 will reflect to a larger extent the content of the paper: “Testing the influence of two different microbial communities on aggregate stability in a sandy soil”?? Here the biochar effects should also be considered. Explain why not using pure soil but a mixture of soil plus biochar. Further I would like to ask the authors to consider the aspect that gamma radiation to free organic matter because of cell damage.

Abstract L43. Please correct into “Therefore samples of a... were...” L46 A non-incubated subsamples is used as a control. The abstract should also contain a statement reflecting the conclusion of your study.

Introduction L148 please add an explanation why your studied the effects of microbial communities of aggregate formation by using a soil + biochar mixture instead of a soil itself? Please note within the conclusion how this statement is tested: true or false?

Material and Methods Please add references on the methods used for -homogenization of biochar + soil mixture, - gamma radiation, -filtration and -autoclave procedure etc. Note where the “R2A broth” (“mixture” may be a more common synonym for broth, or is “R2A broth” a trade name?, in this case please mark it accordingly), add a reference. L191 Are there any references on these procedures please add them or add missing information (e.g. testing incubation conditions to be constant. . .) L202 Please explain why “soil extract could exceed the adjusted water content “ (at line 194 you stated a “. . .constant matrix potential..”). Please explain the reason to discard these exceeds. L204ff please add references or explain the reasons for choosing the mentioned gradient in temperature, the disconnection of the hanging water columns etc. L221 Please add references on the procedures described here. . . L224 please add information how the 260/280nm ratio is obtained (I assume an UV-vis spectral analysis. However, this needs to be mentioned within the manuscript including a reference that shows this ratio to reflect purity of DNA samples). L225-240 Please add all missing references. . . L257 add a reference L263 please note a reference on the statistics. L275-335 PLEASE explain all abbreviations like DNAEUB (is it equal to EUB338/EUB518 primer pair?) and their meaning with respect to microbial diversity within the materials and methods section. . . . . L336 please add within materials and methods how you analyze the particle size fractions for Cfrac and Crel . . . Please explain the meaning of “oLF500. . .” etc. L379-384 seem to belong into introduction (include missing references)

If you introduce an abbreviation please use it consistently throughout the whole manuscript.

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Discussion paper



Please note within discussion and conclusion how the hypotheses (including the last statement of the introduction (L147-149) given in the introduction were tested. Add a summary of those results within the abstract.

L415-420 please clarify these statements. Please add a discussion on the effect of gamma radiation on the amount of decomposable organic matter... Such organic molecules may (i) interact with mineral soil as well as the biochar components in an abiotic way and may potentially force microbial activity.

Figs. mention within figure 1 where the soil sample is located?

Please explain which figure/table represents the data on aggregate stability? Are the data on “cumulative SOC release” used as a measure for aggregate stability? Explain why.

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