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Interactive comment on "Effects of sterilization techniques on chemodenitrification and N_2O production in tropical peat soil microcosms" *by* Steffen Buessecker et al.

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We thank the reviewer for positive comments and pointing to a few improvement points. Below find the specific answers to each one

L23-25: suggest splitting into two sentences and making the second sentence a more concrete statement of the reactants/conditions necessary for chemodenitrification, similar to that of L84-87. Not all readers readily familiar with chemodenitrification. | The sentence was split accordingly. The parameters upon which chemodenitrification is dependent are now defined more clearly.

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L34: Consider adding, “of NO2- consumption” to the sentence, "dominant process..." | It was added.

L34-35: Consider defining abiotic N2O production as one endpoint of chemodenitrification. | We added a defining statement.

L50-52: Example of use of ‘non-enzymatic’ and ‘abiotic’. Please define and then be consistent with use of non-enzymatic vs abiotic. Suggest using just one term, abiotic is more common, I believe. | For clarity“Non-enzymatic”was removed and“abiotic”was used throughout.

L56-58: Check equations. Are H2O and H+ flipped? L60: Cu2+? Should this be Fe2+? | Thank you for catching the error on citing Eq 3 as with Cu when Fe was listed in Equation. We revised in depth the reports on Eq 3 (with Fe) or the possible alternative with Cu, and concluded that the evidence provided to support the feasibility of Fe based equation was limited, the conditions required for its occurrence in nature very unlikely and could cause some unintended confusion. As per Cu, it will not have the role as reductant in reaction either. Hence we removed equation 3, indicated the lack of knowledge on the potential abiotic reduction of N2O and the unlikelihood that this reaction catalyzed by Cu in peat soils. Now L 60-63. We believe this address in depth the point of reviewer.

L66-L72: Found this section a bit confusing. A sentence or two introducing and/or contextualizing these reactions would help readers who are not familiar with these processes. Suggest adding an explanation of how these processes could be affected by sterilization techniques, if indeed that is the point of this part of intro. . . | A sentence was added to clarify that organic functional groups are possible reactants to NOx– just like soil metals (now L67-68). Also, a sentence in L81-82 was extended to reflect that those pools are affected by the methods or techniques used for sterilization: “but affecting metals, organic matter or other pools”.

L73-74: Equations absent | Eq 4 (we changed it to Reaction Scheme 1) is a scheme

showing nitrite reaction with phenolic groups that perhaps pdf version did not show in reviewers copy. We have added it, we are making sure the correct technical name (Reaction Scheme) is used and we are checking that it appears in file. Now L76

L124: Were all treatments prepared in an anaerobic glove box prior to incubation? | Indeed, a clarifying sentence was added in L140 in initial MS and now L143-144.

L175: N2 or H2 glove box? Not sure if it would matter, just checking for consistency | This was corrected and specified as 0.5% H2 in N2. Now L 180-181

L268: Zn data is shown in Fig. 3, referring to another figure or a typo? | There is a small confusion here Zn data mentioned in line is in reference to changes in native Zn metal concentration in samples, while Figure 3 has a legend indicating Zn as the treatment (ZnCl2). As for correction, we included in the sentence a term of "metals in soil samples" (L 277); and all figure legends have received the inclusion of a sentence explaining that "X-axis represents treatments where Zn=ZnCl2, etc." Thank you for pointing this out, figures will be clearer with this info.

L292: increased the FI relative to what? Suggest reminding readers of what the baseline and controls were for Table 1, or maybe I missed this explanation earlier. Not sure if referring to a change in time or change relative to live or relative to +/- nitrite etc. | We added a clarifying statement indicating that the first value is from live soil baseline prior to NO2– incubation in now L296.

L307: where is r2 value coming from, was there a regression analysis done? | We added a clarifying statement in now L311-312. A linear regression over full experimental data range was conducted.

L327: However, to me many of the NO2- consumption lines do not look highly linear in first 48 hrs (Fig. 5). | That is correct, we stated now that this linearity is more reflected in the N2O curve. Now L 337

L380: none -> no | Corrected.

L392: delete ‘accompanied by’? or check grammar of this sentence | Corrected.

Please also note the supplement to this comment:
https://www.biogeosciences-discuss.net/bg-2019-282/bg-2019-282-AC1-supplement.pdf

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