



## Comment on soil-2020-92

Anonymous Referee #2

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Referee comment on "The role of geochemistry in organic carbon stabilization against microbial decomposition in tropical rainforest soils" by Mario Reichenbach et al., SOIL Discuss., <https://doi.org/10.5194/soil-2020-92-RC2>, 2021

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### Review Comments

- I) General comments

I consider the submitted manuscript merits publication due to novel and interesting findings are reported covering tropical soil which has been so far neglected. In general, the manuscript is well written and structured.

However, the most important concern for me is the research design, why the slope plots are 6 while valley and plateau are 3 each?

How could you justify the absence of soil erosion at the sampling plots as mentioned in your results section while sediment soils were collected in the valley plots? Kindly elaborate on this in your discussion.

Though in forest, there is no or little surface soil erosion but landslides occur most of the time in Tropical forest

I understand that one of the main focuses was Geochemistry of the three sites, while you also recorded soil fertility parameters especially chemical. but anywhere biological parameter such enzymes related to carbon cycle such as b-glucosidase which decompose carbon source is important for the decomposition were recorded? or mentioned in relation to the study.

- II) Specific comments

- 1) could you elaborate why the slope of you compared sites of different slopes eg., Kibale site (3-55%) while Kahuzi-Biega and Nyungwe have similar slopes (1-60%).
- 2) Soil development is dependent to several factors including environment, which are different from the three. What was your reference of standardization to justify the study comparison between the sites.
- 3) in material and methods you are referring to Fick and Hijmans, 2017. is his work conducted in all your study regions?
- 4) How could you compared results from three different slope length beside variability sites elevation. e.g., Nyungwe and Kibale sites are more variable than Kahuzi biega.
- 5) How can you explain the absence of soil erosion in plots, while the sampling was conducted during rainy season (March to June)
- 6) on the paragraph 340 "Not significant correlation was found with the included climate variables (data not shown); For the reader to realize that they were not significant difference a figure or table is require. can you add that?
- 7) on 360; You mentioned that total P was high in Malfic region as compared to both mixed sedimentary rocks and felsic regions. How could you justify your finding with the known situation of low available P in that region?
- 8) At 365; How the reader could know that the study region is highly weathered without displaying soil data of all the three depths?
- 9) at 375; How could you explain the high depletion of P (72 to 14 %) in parent material under natural conditions? (without any agricultural activity that could contribute to P removal)