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Interactive comment on "Patterns of microbial processes shaped by parent material and soil depth in tropical rainforest soils" *by* Laurent K. Kidinda et al.

Anonymous Referee #2

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This manuscript explores how soil geochemistry (parent material) influences microbial functions in weathered tropical rainforest. To do so, the authors used the classical soil forming factors as an approach. They assume that time for soil development, climate, topography and biota are kept constant, and only parent material (geology) varies (mafic, mixed and felsic). However, as a reader I miss information on biota. Vegetation is "dense tropical forest" (line 91, Wilken 2021, missing in the references), but is soil fauna actually identical? Does the microbial community composition change? Do plant species differ? The authors should clarify why they believe that the factor "biota" actually is kept constant across the catena and different parent material. After all, the whole methodological approach is based on the assumption that all soil forming

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Discussion paper

factors are kept identical, except parent material.

Overall, I found it difficult to identify a key message of the manuscript. Maybe it would be good to simplify and shorten (39%) the text, show less figures, and focus the conclusions on the results on the results shown in the manuscript.

There is some potential for clarifications:

Introdution – briefly explain the differences between mafic and felsic

Sample handling – the soil samples were air-dried (line 117), which typically should be avoided for reliable analysis soil microbial biomass and extracellular enzyme activity.

Statistics and data presentation – The data presentation is difficult to follow, e.g. the choice of the vector analysis warrants an explanation. How can the p-value be 0.00 (line 277; Fig 5)?.

Results - The results are consistent with general knowledge that tropical soils are P-limited. The authors should emphasis on similarities/differences to other tropical systems.

Discussion - Typically manuscripts point out potential methodological limitations, and discuss how these limitations affect the outcome. The addition of such a section would strengthen the credibility of the discussed implications.

Literature citations – some of the citations used are not include in the reference. Unpublished works are referenced multiple times but it is difficult to assess the statements in the manuscripts based on unpublished works.

Conclusion section – much of this is a stretch from the data. The conclusion section should be refocused on the data that is presented within the manuscript.

Some more thoughts and questions: How much C was respired as CO2 over the incubation across treatments? (LINE 125) Did this vary statistically across treatments, and if so, how? Line 96. Spelling of schist Line 190. Spelling of bestNormalize Line 190.

Which transformation was perfomed on which variables? Line 216. Define MBCDOC Line 314. EAA or EEA? Fig 1. The figures should be set up in more comprehensive way, with abbreviations defined and treatments given in the same order and with legends. Fig 5. Are these p values significantly different?

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