

Comment on soil-2021-98

Anonymous Referee #2

Referee comment on "Network complexity of rubber plantations is lower than tropical forests for soil bacteria but not for fungi" by Guoyu Lan et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-98-RC2>, 2021

This study did a comprehensive investigation on soil bacterial and fungal networks in response to tropical forest conversion, by comparing the network degree within microbial community and between microbiomes and environments under protected rainforests with those under rubber plantations. The author demonstrated a simpler bacterial network while a more complex fungal network in the rubber plantations, mainly through comparing the network degrees. The idea is novel, the method is reasonable, and the main results can advance the understanding of soil microbial shifts caused by forest conversion in tropical areas and help with the management strategies in terms of soil system. Nevertheless, I have some minor issues on the manuscript organization that should the author concern before accepted by SOIL. 1) Too much description of tropical biodiversity (both above and below ground communities) in the introduction make it difficult to concentrate on the hypotheses. 2) Some definitions and expressions in methods need further clarification, such as sampling interval, shared edges, keystone taxa, etc. Moreover, the bacterial-fungal interkingdom network analysis is proposed to investigate soil microbial network complexity. 3) As the author investigates the connections of microbial communities with soil nutrients content and functional groups, further explorations about the potential effects on ecosystem functioning caused soil microbial network shifts might be important. 4) English Grammars and some word expressions need to be improved.

Detailed comments/technical corrections:

- L21: rainforest should be rainforests;
- L22-23: we used the data from Illumina sequencing and metagenome shotgun sequencing...;
- L25: please clarify the "shared network edges";
- L32: in rubber plantations...; please remove "higher" before links;
- L33: forest conversion increased fungal network complexity;

- L34-35: maybe it is more clear as "The keystone taxa in bacterial networks shifted from Acidobacteria in rainforests to Actinobacteria in rubber plantations";
- L37-39: it is not clear for the relationships between soil properties and microbial network structure, Please rewritten the conclusion sentence;
- Please add some values when describe the changes in networks;
- L93-94: remove"[3]", did you investigate soil microbial activity?
- L98: drivers and mechanisms: do you mean the soil properties or relating soil processes? Please clarify;
- L112: Please move the sentence "Rainfall is abundant, ranging from 1000 mm to 2600 mm yearly, with an average annual precipitation of 1639 mm." to L109;
- L115: When the rubber plantations have been established and what are the total areas? Need general information of the forest conversion;
- L118-120: What are the criteria when selecting these sampling sites?
- L122: Which soil layer?
- L123: What means sampling interval?
- L127: soil water content; please specify the sample store conditions;
- L138: archaeal community was not included in the following analysis;
- L139: The sequence data should be deposited in an online dataset ,such as NCBI;
- L183, L196-199: The connectors, module hubs and network hubs have been commonly identified as keystone taxa in network in many studies, what are the differences between these network groups and the keystone taxa that you identified in 183?
- L228: What means "more correlations"? please clarify;
- 237-239: Maybe the statistical comparisons of network parameters should be applied to obtain this result;
- L284-288: Need statistical values or network parameters when comparing the network complexity;
- The whole results section is wordy, Please simplify by concentrating on the main results;
- L392-394: Did the rubber plantation received any fertilizer?
- L420: impact on
- L421: what kind of implications for ecosystem functions? Could you please be more specifically?
- Figure 8: Maybe it is better to use different symbol to display environmental variables.