

Additional comments

L108 Study area and Sample collection: Please indicate when the samples were collected (year, month, season, etc.)

L122: For how long was the soil air-dried?

L132: Did you use the soil stored at 4°C or the air-dried soil for this part?

L149: How much soil did you use? Did you follow the manufacturer's instructions as given, or were there any modifications or preprocessing of the sample? Did you evaluate the quality and/or quantity of the extracted DNA?

L149-150: Was this a pair-end sequencing? What type of library did you use? What was the coverage of the sequencing? Was the sequencing carried out for you or in a core facility?

L149-170: What version of each software was used?

L152: Is this a typo: ontained?

L153: Optimized, how? Maybe you mean the filtered sequences?

L153-154: Did you assemble a unique metagenome using all the samples? Was it a separate one for each soil type or for each sample?

L159: Did you get the translated proteins from Prodigal or did you use an additional tool?

L160: Which version of the NR database did you use?

L160: Did you use Diamond for the taxonomical classification of the homologous protein or also to annotate additional proteins besides the CAZymes? Please specify.

L163: Did you use the gene catalog for the annotation, or did you annotate every sample? Did you use any tool for annotation, such as dbCAN? What version of the CAZyme database did you use?

L168: Did you use any program to normalize the counts? Was the normalization used just for the CAZyme abundance comparison, or did you also use the normalized counts in other parts of the analysis?

L172: Did you evaluate whether the data were normally distributed before using a parametric test? If yes, what test did you use?

L174-176: Was this analysis performed with the normalized genes?

L178-179: Did you also include other variables in the PERMANOVA analysis?

L196: What do you mean by “lower mass”? In which figure is the mass depicted?

L206: It would be convenient for this and the other figures to use a more contrasting gradient of colors or a different palette.

L211: The figures described in this section do not match the right figure (Figure 2).

L218-219: At the beginning of the paragraph, you're talking about the increment in percentages, but here you are talking about rates. Maybe it would be better to keep the same units.

L248-250: It would be clearer to describe only Figure 4 in this paragraph (without introducing Figures S2 and S3 at the beginning of the paragraph) and use the next paragraph to include Figures S2 and S3.

L258: The selection of colors in this plot does not allow to differentiate between enzymes. I suggest using a different color palette with better contrast.

L266-267: How is this a decreasing trend if it is higher in coniferous?

Figure S3 and S4: Although this is just a supplementary figure, it would be easier to distinguish the significant differences if the lines with the asterisks were closer to the bars. The same for Figure S4. Consider using a more contrasting color palette. This would benefit the visualization of the results.

L274-283: Figure S4 is mentioned here more times than Figure 5. Maybe it would be more reasonable to have Figure S4 in the main manuscript instead of Figure 5. It is also better suited to what you want to describe.

L284-285: Maybe something to include in the discussion.

L303: Microbial metabolic activity? Perhaps it would be better to call it a metabolic profile, since you are not measuring the metabolic activity.

L309-310: Although the soil physical and chemical properties were combined, the total variation should sum 100%, and this is not the case.

L318-319: What was the interactive effect of the bacteria-derived carbon?

L322-323: Water content is twice. Maybe you mean the carbon-nitrogen ratio.

Figure 7a: What does the size of the square represent?

L342-346: Either the diversity of the enzymes and the carbon fractions is different between forest types, so why not try a separate analysis for each of them if that is also part of your third aim? A correlation test is also possible here.

L351-354: To talk about community structure, you would need to consider the phylogeny of the full community after the metagenome assembly, and that was not what you did. What you presented is just the taxonomy associated with the homology of the annotated CAZyme, which, as you mentioned in the results, represents only 18.83% of all genes in the metagenome.

L357-359: This can also be influenced by the database. Many of them (including CAZyme and the NCBI NR database) are more enriched with bacterial genomes than fungal genomes.

L366-368: Could this be related to the amount of biomass available for degradation?

L377-379: That is an interesting insight.

L385-386: This suggestion would be better supported by the results that contrast soil properties with enzyme abundances for each family, as you did for the plant-derived, fungi-derived, and bacteria-derived classification.

L406-411: I'm not entirely sure if I understand the message of this paragraph correctly. At the beginning, you talk about distinguishing carbon sources when evaluating microbial functionality, but the conclusion concerns forest type, with little clarification in between. I think you need to reword it a little bit.

L427-434: That is an interesting conclusion.

L439-445: How is this connected with the fact that your POC:MAOC is almost 1 in broadleaf, being the lowest one among all the forest types?

L450-454: This is a pretty interesting summary of your results. However, it doesn't reflect what you were explaining at the beginning of the paragraph. You should either consider including this in a different paragraph (like the next one) or reframe to specify that it includes all the results and not just the ones that you mention at the beginning of the paragraph, which is what this "together" is referring to.

L456-465: How is the soil stability defined? You find a high MAOC in broadleaf and low in bamboo, but the POC:MAOC is pretty low in broadleaf as well.

L483-486: How is this a conclusion of your study when you never evaluated this possibility?

L488: Since vegetation composition was never mentioned or evaluated in this study, you should probably call it forest type.