

Dear Editor,

Thanks very much for your decision of *Minor Revisions* on our manuscript. We appreciate the positive evaluation and the opportunity to revise our work.

We have carefully addressed all the comments and suggestions raised by the reviewers. The revised manuscript has been updated accordingly, and we believe all concerns have been fully resolved.

Attached please find our point-by-point responses to the reviewer's comments.

We thank you and the reviewers for the constructive feedback, which has undoubtedly strengthened our paper. We look forward to your final decision.

Best regards,

Zhiqiang Wang, and on behalf of all co-authors

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Response to reviewer's comments

Responses to the Reviewer #2's comments

I have no more comments this time.

Response: Thank you very much for your positive feedback and for indicating that you have no further comments on the revised manuscript. We appreciate your time and expertise in reviewing our work and are pleased that the revisions have addressed your previous concerns.

Responses to the Reviewer #3's comments

This manuscript presents a data-rich and analytically rigorous global meta-analysis that effectively addresses a significant knowledge gap in cross-ecosystem comparisons of soil organic carbon contributions from fungal versus bacterial necromass. The authors systematically assess these contributions in agricultural versus natural ecosystems, employing a rigorous research design with extensive data sources and appropriate statistical methodologies. The manuscript is commendably well-structured and logically coherent.

Based on the strengths of the study, I recommend Minor Revisions prior to acceptance.

Response: Thanks for the positive comment.

Specific Comments:

1. Line 47: Please update the citation to read: "Cotrufo et al., 2013; Angst et al., 2021."

Response: Thanks for this comment. We have updated the citation (Line 47).

2. Lines 74–76: Consider rephrasing for clarity and conciseness. A suggested revision is: "As bacterial amino sugars are readily degradable, while fungal chitin and -glucans are more recalcitrant, fungal necromass generally exhibits a longer turnover time in soil compared to bacterial necromass."

Response: Done as suggested (Lines 74–77).

3. Lines 170–171: There appears to be an inconsistency regarding the inclusion of Mean Annual Precipitation (MAP) as a climatic factor. The statement on these lines suggests MAP is not included, yet subsequent analyses clearly incorporate it. Kindly review and correct this statement for accuracy.

Response: Thank you very much for pointing out our error and providing the constructive suggestion. As suggested, we have revised the relevant statement to now read: "climatic factors (mean annual temperature [MAT] and mean annual precipitation [MAP])".

For further details, please refer to Lines 170–171 of the revised manuscript.

4. Line 171: The abbreviation “TN” is used without prior definition. Please introduce “Total Nitrogen” followed by its abbreviation “(TN)” upon its first appearance in the main text to comply with standard academic writing conventions.

Response: Thanks. As suggested, we have introduced the full term “total nitrogen [TN]” upon its first appearance (Line 172) in the revised manuscript.

5. Section 4.3 (Lines 460–477): The section currently states two limitations. However, a closer reading reveals that three distinct points are discussed. Please adjust the introductory statement to accurately reflect the number of limitations presented.

Response: We acknowledge and apologize for this oversight. In the revised manuscript, “two limitations” has been replaced with “three limitations” (Line 462).