

Dear Editor and reviewers.

Thank you for the thorough review and constructive criticism on our paper. The whole process has greatly improved the manuscript. We have addressed the reviewers' comments completely in this revision. This includes edits to both Figures 1 and 2 including the caption to Figure 1 to better convey the hypotheses depicted there in the right side of the figure. We have also edited the introduction and added some mechanistic explanation within discussion section 4.2 in addition to other edits as pointed out by both reviewers.

Point by point response to each reviewer.

### Reviewer 1

I find that my previous comments have been well addressed. I have only a few minor remaining comments (see below).

Technical corrections

Line 20: "comes"

Response: Corrected.

Line 24: Should this be "each other"?

Response: Corrected.

Line 54: Explain the abbreviation "Ea".

Response: Corrected.

Line 61: "elevated" and "enhanced": Compared to what?

Response: Corrected.

Figure 2: Is it on purpose that the "mesocosms built" field for H is empty?

Response: This was also raised by the other reviewer. We have carefully reviewed Figure 2 to see what the issue was and could not find anything missing from the H horizon information provided in the figure. We did, however, better align the middle column providing each separate horizon and corrected a couple of inconsistencies which we hope addresses this issue which may have been from the formatting into the final document.

Line 269: "resulted"

Response: Corrected.

Line 294: "whole"

Response: Corrected.

### Reviewer 2

I think the author's have properly addressed my comments. Still there are a couple of issues that needs consideration:

Response: All comments provided in the attached revision were addressed and can now be found in tracked changes in the new revision provided.

I am not sure that hypotheses are well explained in Figure 1. The representation of the hypotheses in the right hand illustrations is a bit confuse, and texts within the boxes not clear. A better, simpler, representation and explanation in the caption should be possible

Response: Understood, Figure 1 has now been edited in two ways. First the text has been reduced in that far right portion of the figure to more generalize the hypotheses. Second, the figure caption has been edited to better clarify the hypotheses stated there as well. We hope this helps to better represent the hypotheses to the reviewer/reader.

On the other hand, reading the intro and hypotheses it is a bit unclear what is the mechanisms the author's want to test in Hypotheses 2: Does they want to test whether fungi are using labile C from L to degrade N-rich substrate from F and H? or does the labile C from L leaches to F and H?

Response: Parts of the introduction have now been edited to better clarify the stated hypotheses. The hypotheses include both possibilities – that is use of labile C leached from the L to degrade more slow-turnover substrates from the F and H but also the possibility of specifically enhancing fungal use of L substrates and their degradation of more N-rich substrates from the lower F and H horizons.

Interesting, thought, that N cycling is not altered by temperature or priming whatsoever. Which are the mechanisms that allows increasing rates of mineralization without the need for extra N use?? Perhaps a couple of sentences should be added where the authors explain what may be happening so that the increase in the use of C does not translate into increases in the use of N (section 4.2.)

Response: Good point here. A couple of sentences were added to section 4.2 to help clarify the possible mechanisms responsible for this observation.

Some editing will be needed in the intro section (see enclosed manuscript)

Response: All edits as suggested were made and tracked in this new revision.

Some more comments in the Manuscript enclosed

Response: All comments were addressed with the further revisions made in the manuscript.