

July 12th 2018

## **A Response to Reviewers**

Dear Anja Rammig,

We would like to thank you and the the reviewers for the thoughtful and valuable suggestions on our manuscript entitled “Understory vegetation plays the key role on sustaining soil microbial biomass and extracellular enzyme activities” (bg-2017-545). We have carefully revised our manuscript to take account of your and the reviewers’ comments. Please find below our responses (color-coded blue) to Editor’s and Reviewer’s comments (repeated in an italic font).

### **Comments from Editor**

*There are a few corrections suggested by the referee. Please revise and then we can proceed with the publication of the manuscript.*

**Response:**

We have revised the manuscript to take account of the corrections suggested by the referee.

### **Comments from Reviewers**

#### **Anonymous Referee #2:**

*1. Line 26 add: This suggests that in the absence of Understory microbes invested...*

**Response:**

We have revised the sentence “This suggests that the microbes invested more in C acquisition than N acquisition because the carbon (C) inputs were less labile.” to “This suggests that in the absence of understory vegetation microbes invested more in C acquisition than N acquisition because the carbon (C) inputs were less labile.”.

*2. Line 38 delete the “the” before “understory vegetation is removed”, delete the “the” after “such that”.*

**Response:**

We have revised the sentence “When the understory vegetation is removed from forest ecosystems, soil processes are influenced, such that the above-ground plant diversity and biomass decrease (Lamb et al., 2011; Fu et al., 2015) and the characteristics of the below-ground rhizodeposits change (Li et al., 2013)” to “When understory vegetation is removed from forest ecosystems, soil processes are influenced, such that above-ground plant diversity and biomass decrease (Lamb et al., 2011; Fu et al., 2015) and the characteristics of the below-ground rhizodeposits change (Li et al., 2013)”.

*3. Line 68 revise “reduced” to “decreased”.*

**Response:**

We have revised “reduced” to “decreased”.

4. Line 76 delete the “the” after “To maintain...”.

Response:

We have revised the sentence “To maintain the soil fertility, it is important that C sinks and tree growths are sustained in these forests” to “To maintain soil fertility, it is important that C sinks and tree growths are sustained in these forests”.

5. Line 193 revise “C and N cycling” to “C and N storage”.

Response:

We have revised “C and N cycling” to “C and N storage”.

6. Line 196 revise “all the treatments” to “all treatments”

7. Line 196-197 delete “to avoid any effects of above-ground litter.”

Response:

We have revised the sentence “In our study, we removed the litter from all the treatments to avoid any effects of above-ground litter” to “In our study, we removed the litter from all treatments”.

8. Line 200 liable C was typo.

Response:

We have revised “liable C” to labile C”.

9. Line 203 delete the “the” before “soil N contents”

Response:

We have revised “Previously, researchers found that the soil N contents increased when...” to “Previously, researchers found that soil N contents increased when...”.

10. Line 280-282 “The positive relationship between the activities of C-degrading enzymes and the soil inorganic N contents suggest that C decomposition was inhibited by the lower available N contents after understory vegetation was removed.” I think it is both ways, the understory vegetation delivers less labile C, this increases the microbial demand for C degradation of SOM, and this leads to a loss (because decomposition is greater than inputs) of C from the soil. Somehow the argument with lower N available is counterintuitive, because it could be expected that with less N is taken up by plants, which could reduce the competition between plants and microbes. However, with reduced litter and understory root material inputs also N inputs decrease, therefore no surprisingly N also decreases over time.

Response:

We have add the sentence “It could be expected that with less N is taken up by plants may increase soil N content after understory vegetation was removed, however, soil N inputs decrease with reduced understory vegetation root material inputs, which leads to inorganic N decreases over time” in the Conclusion section. See Line 280-282.