Response to the Comments of Reviewers

Chen and the co-authors conducted a N addition experiments in subtropical region to investigate the responses of POC and MAOC to N addition and as well as the underling mechanisms. They found that 1.5-year N addition significantly increased POC content, but had no effect on MAOC. Consequently, the ratio of MAOC to POC was decreased in N addition plots. The increased POC was positively associated with the increasing input of plant litter. Their findings are of course important for the assessment of effect of N deposition on C pools. The manuscript was well prepared and easy to read. However, I have some concerns need to be addressed before this manuscript could be accepted.

Response: Thank you very much for your kind work and constructive comments and suggestions, which greatly improved the quality of the manuscript.

First, the novelty of this experiment or the finding of this manuscript needs to be highlighted.

Response: In the present study, the main finding is that the response of different SOC functional fractions to N addition is inconsistent. Specifically, short-term N addition has a significant positive effect on POC, which is attributed to the combination of increased plant litter input and decreased microbial decomposition. By contrast, the mineral sorption and desorption reactions jointly led to no significant response of MAOC to N addition. We have highlighted in the new manuscript.

Second, the duration of N addition was two short (only 1.5 years). Of course, several properties that were susceptible to N addition may be changed under N addition, such as the activities of soil enzymes and the contents of exchangeable cations. However, plant litter input change also significantly affected by N addition in such short term. Could you please provide the monthly data of plant litter input for different N addition treatments?

Response: The monthly input data of plant litter under different N application treatments are shown in the Figure R1. Litter from the same plot (with three traps) was collected and mixed in the laboratory. The collected litter was dried and weighed to determine the aboveground litter product.

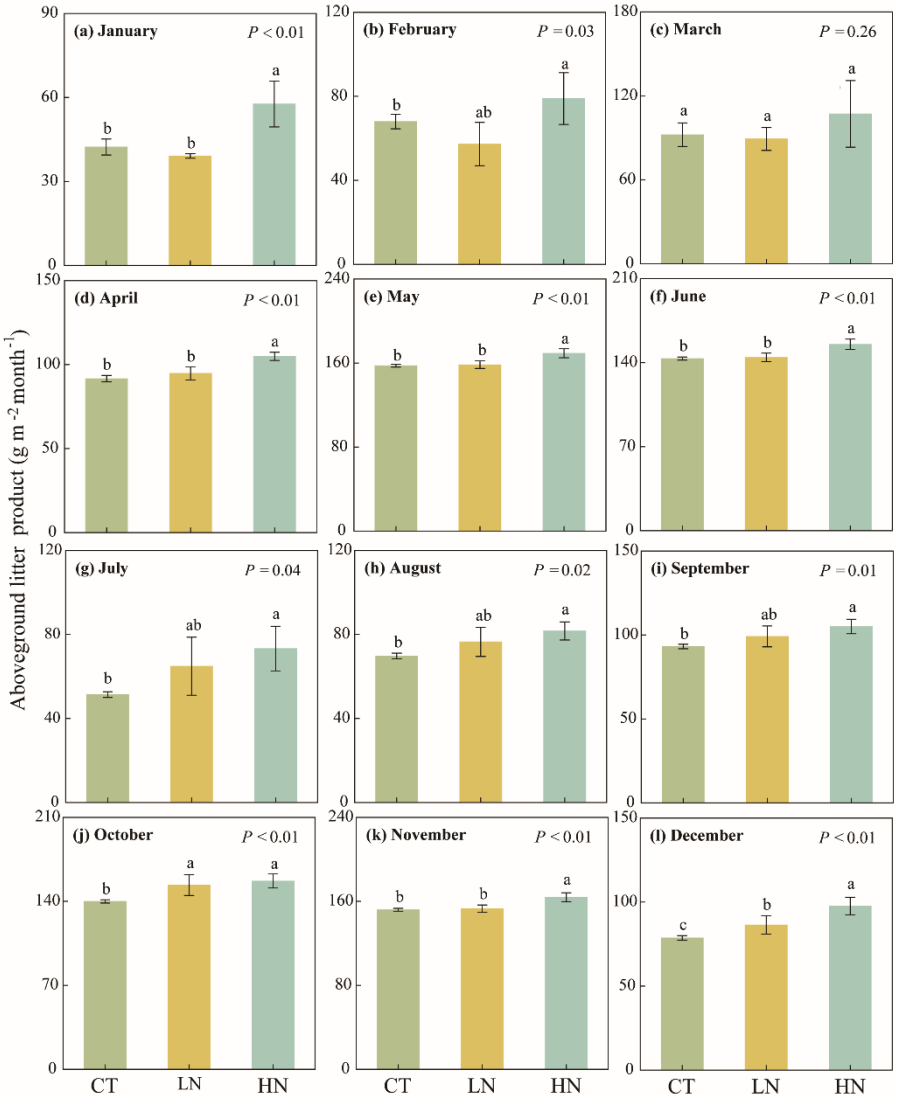

Figure R1 Effects of N addition on aboveground litter product in each month.

Third, the non-significant response of MAOC to N addition may be mainly due to the duration of N addition was too short.

Response: We agree with your point of view and have added this reason to the new manuscript. Please see Lines 288–290.

Forth, the information about the background N deposition rate need to be provided, because this information was tightly linked to the reason for the choosing of 40 and 80 kg N ha^{-1} yr^{-1}, respectively, as low and high N addition.

Response: The low and high here are equivalent in this manuscript. Yuan et al. (2016) investigate the background value of local nitrogen deposition flux in Daiyun Mountain National Nature Reserve of Fujian province using N deposition collector. The results showed that N deposition of Daiyun Mountain National Nature Reserve was 17 kg ha^{-1} from March to October in 2015. In addition, we also combined the N deposition in other regions, such as Dinghu

Mountain in South Asian tropics (38 kg N ha^{-1} yr^{-1}; Zhou and Yan, 2001). Finally, we set up the following experimental treatments: control (CT, +0 kg N ha^{-1} yr^{-1}), low-N addition (LN, +40 kg N ha^{-1} yr^{-1}), and high-N addition (HN, +80 kg N ha^{-1} yr^{-1}). We have added the information about the background N deposition rate. Please see Lines 123–135.