

## ***Interactive comment on “Fungi regulate response of N<sub>2</sub>O production to warming and grazing in a Tibetan grassland” by Lei Zhong et al.***

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Thank you for your suggestions. We have revised our manuscript “Fungi regulate response of N<sub>2</sub>O production to warming and grazing in a Tibetan grassland”, based on your comments. We have carefully addressed each comment and our responses to these comments are listed below. The attachments are the manuscript which had improved as your suggestions. We hope that all necessary revisions have been made. However, we would be prepared to make further revisions and modifications if required.

[Comment]- This study reports the effect of warming and grazing on soil biotic contribution to N<sub>2</sub>O production in a Tibetan grassland, by examining a long-term (over 10 years) experiment combined with an incubation experiment. Their results indicated

C1

that fungi could be the main source for N<sub>2</sub>O production potential in the Tibetan alpine grasslands. Overall, the manuscript is of interest and generally well written. But there are some concerns and unclear points that should be addressed prior to publication. Please find some more detailed comments below.

1. Lines 162-164, is it enough to collect only 5 cores for each soils?

For soil sampling, “randomly collected” was used to reduce the spatial heterogeneity. At our site, soil samples were collected using this method in all related experiments because the plot area used for warming was limited. However, this sampling method was proved to be suitable which can be found in a series of our published papers in Ecology (Wang et al. 2012), Global change biology (Luo et al. 2010), Journal of soils and sediments (Rui et al. 2012) and so on.

2. How the authors draw the contribution of bacteria and fungi to total nitrification enzyme activity and total denitrification enzyme activity as shown in Fig. 5? I cannot find the specific description in the section “Materials and Methods”.

Thank you for your comment. In the new version, we added the description in Materials and Methods”. Please see the lines 245-248.

3. Line 257, “Fig. 1A” should be changed to “Fig. 1a”, based on the Figure 1. Also, the authors should revised it throughout the main text.

Corrected.

4. Line 259, “soil moisture” should be changed to “The average soil moisture”.

Corrected.

5. In Figs. 1 and 4, why significant differences were only shown in Figs. 1b and 4e rather than all of subfigures?

We have removed different letters from the Figs. 1b and 4e. The two-way ANOVA results in all figures were enough. Please see lines 589-611.

C2

## References

Luo, C., Xu, G., Chao, Z., Wang, S., Lin, X., Hu, Y., Zhang, Z., Duan, J., Chang, X., and Su, A.: Effect of warming and grazing on litter mass loss and temperature sensitivity of litter and dung mass loss on the Tibetan plateau, *Global Change Biol.*, 16, 1606-1617, 2010. Rui, Y., Wang, Y., Chen, C., Zhou, X., Wang, S., Xu, Z., Duan, J., Kang, X., Lu, S., and Luo, C.: Warming and grazing increase mineralization of organic P in an alpine meadow ecosystem of Qinghai-Tibet Plateau, China, *Plant Soil*, 357, 73-87, 2012. Wang, S., Duan, J., Xu, G., Wang, Y., Zhang, Z., Rui, Y., Luo, C., Xu, B., Zhu, X., and Chang, X.: Effects of warming and grazing on soil N availability, species composition, and ANPP in an alpine meadow, *Ecology*, 93, 2365-2376, 2012.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2017-552/bg-2017-552-AC2-supplement.pdf>

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