Biogeosciences Discuss.,
https://doi.org/10.5194/bg-2017-552-RC6, 2018

Biogeosciences Discussions
Open Access
EGU

Interactive comment on "Fungi regulate response of N_2O production to warming and grazing in a Tibetan grassland" *by* Lei Zhong et al.

Anonymous Referee #6

Received and published: 13 April 2018

The paper presented an interesting topic, which focused on fungi regulating the responses of N2O production to warming and grazing treatments in Tibetan grassland. The authors report several new information, such as an increased bacterial enzyme activity and a decreased fungal enzyme activity of regulating N2O emissions under warming treatment. The findings have implications for well-understanding the responses of N2O emissions to the scenario of climate change and/or disturbance. However, there are sevel concerns need to be addressed.

1. The description of experimental desigh is not clear, particularly, there is a confusing in introducing winter grazing treatment. What is the reason for the selection of winter grazing treatment in present study? Tibetan grassland is experienced to be covered by snow, frozen soils, and the grass should be withered in winter. In the same plots,

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the ecological effects of winter grozing should be interferenced by previous different grazing treatments (lines 153-156). How to avaid it?

2. Potential total nitrification/denitrification for N2O emission rate from incubation experiment is not a “real” rate of N2O emission under the field conditions. In terrestrial ecosystems, soil temperature, moisture, pH, soil N availability, and DOC etc. are generally considered as the major factors of controlling N2O emissions. For this study, the lack of field simultaneous monitoring data of N2O rates is a critical issue. Although the authors tried to cite the previous results for discussion, the conclusion obtained from an incubation experiment is still not general acceptable.

3. The underlying mechanisms that fungal and bacterial pathways for controlling N2O emissions remain unkonwn. The authors need to elaborate the relative contributions of fungi and bacteria in nitrification and denitrification processes of N2O productions.

4. Line 130-131: The symbol oC is not correct.

5. There are several mistakes in English writing, which should be revised throughout the text.

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