

## ***Interactive comment on “Grazing elevates litter decomposition but slows nitrogen release in an alpine meadow” by Yi Sun et al.***

**Yi Sun et al.**

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### Response to referee #2

General comments Referee: This is a very interesting paper that I have read in the past years. It is worth for publishing and suitable for this journal. The authors investigated the decomposition of litter mix through incubating ‘in situ’ and across environmental conditions over 800 days, providing significant insight into the general nutrient cycling in the alpine ecosystems. The Introduction has provided sufficient background information for the importance of this work. Experimental design is clear. Data analysis and result presentation are appropriate. The authors have logically discussed and interpreted the main findings. However, I have also made a few specific comments or

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suggestions to improve this manuscript as outlined below:

Our response: We appreciate all of the referee’s positive comments and thoughtful suggestions. We have accepted all of the suggestions after considering that of Dr. Subke and referee #1. We explain how we have revised the manuscript by following the referee’s comments one by one.

Specific comments

(1) Referee: Lines 20-21 change ‘Incubation site environment had more but litter source had less impact on litter decomposition and N release’ to ‘Incubation site environment had more impact on litter decomposition and N release than did litter source’.

Our response: Thanks. The main findings of this study have been reworded according to the comments of both referees.

(2) Referee: Lines 26-27, remove ‘in China’ in line 26 and allocate after ‘major natural pastures’ in line 27.

Our response: Thanks. We revised accordingly.

(3) Referee: Lines 39 and 287, replace ‘pastures’ with ‘grasslands’. As pastures are different from rangelands which include grasslands, shrublands, woodlands and/or wetlands that grow primarily native vegetation and are often less managed, while pastures are more intensively managed through seeding, mowing and fertilization.

Our response: We thank the thoughtful comments and made corresponding revisions.

(4) Referee: Line 81, change to ‘We tested the hypotheses’.

Our response: Thanks. The hypotheses have been improved according to the comments of Dr. Subke and referee #1.

(5) Referee: Lines 82 and 83, delete ‘whether’.

Our response: Thanks. The hypotheses have been reworded according to the com-

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ments of Dr. Subke and referee #1.

(6) Referee: Line 87, replace 'Qinghai-Tibetan Plateau' with 'QTP' and afterward, as the abbreviation is a commonly acceptable.

Our response: We agree and revised through the manuscript.

(7) Referee: Line 105, should GP be '100 m × 200 m' and GEP be '30 m × 20 m'? Please check again.

Our response: You are right. Thanks. We have revised.

(8) Referee: Line 114, change 'litter of different species' to 'litter of different species collected from each quarter'.

Our response: Thanks. We have improved. Please see line 145 in the revised MS.

(9) Referee: Lines 114-117, you had presented the data of dry weight of palatable and unpalatable species, but it was not clear how you did.

Our response: Thanks. We added one sentence to clarify how to collect these data. Please see lines 148-149 in the revised MS.

(10) Referee: Lines 146-147, did you do the same when measured the dry weight of palatable and unpalatable species? Otherwise it should be mentioned previously.

Our response: We agree. After the revision according last comment, it is clear now. Please see lines 181-182 in the revised MS.

(11) Referee: Lines 151-152, change '...small animals (Vaieretti et al., 2013). The small animals were the plateau pika, *Ochotona curzoniae* (Hodgson) in the present study' to '...small animals (Vaieretti et al., 2013), such as the plateau pika *Ochotona curzoniae* (Hodgson) in the present study'.

Our response: Thanks. We revised as suggested. Please see lines 181-182 in the revised MS.

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(12) Referee: Line 153, change 'Three litter bags' to 'Three litter bags from each treatment'.

Our response: Thanks. We merged these two sentences and changed to "On 20th Oct 2010, the packed litter was incubated above the soil surface by fastening to the ground surface with four steel stakes to prevent removal by sheep and small animals (Vaieretti et al., 2013), such as the plateau pika *Ochotona curzoniae* (Hodgson)." Please see lines 147-177 in the revised MS.

(13) Referee: Line 156, 'a total of 144 packed litter-bags' should be 24 bags/treatment × 4 treatments = 96?

Our response: Thank you very much for the carefully checking. We have corrected it. Please see line 180 in the revised MS.

(14) Referee: Line 164, delete 'those'.

Our response: Yes. We deleted it.

(15) Referee: Line 170, add the unit of decay rate (k), g/day.

Our response: Thanks. We have checked again carefully and revised as the journal requires:  $g \cdot 10^{-3} g^{-1} day^{-1}$ . Please see line 197 in the revised MS.

(16) Referee: Line 172, change 'a is the initial litter mass' to 'a is the initial litter mass (i.e., 10 g in this study)'.

Our response: Thanks. We revised accordingly. Please see line 199 in the revised MS.

(17) Referee: Line 196, as stated in lines 180-120, should read 'litter collected from GP' as 'GP-litter', and read 'litter collected from GEP' as 'GEP-litter' Please revise in the relevant cases afterward.

Our response: We appreciate this comment. Should be 'lines 118-120' in the submitted MS. We have made relevant revisions through the manuscript. Please see lines 226-

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227 in the revised MS.

(18) Referee: Line 211, change 'faster' to 'shorter'.

Our response: Thanks. We removed this sentence as it was not necessary to present such data.

(19) Referee: Line 254, change 'will can in' to 'will result in'.

Our response: Thanks. We have removed the sentence after considering the referee #1's comment.

(20) Referee: Line 268, change 'some degree' to 'a certain extent'.

Our response: Thanks. We changed to "some extent". Please see line 293 in the revised MS.

(21) Referee: Line 287, change 'applied in' to 'applied to'.

Our response: Thanks. We have removed this sentence in the revised MS.

(22) Referee: Lines 292-295, a recently published paper (Liang et al. 2018. Grass Forage Sci.) could be cited.

Our response: Thanks. We agree and have added this paper. Please see lines 78, 108, 319 and 466 in the revised MS.

(23) Referee: Line 296, change 'the the' to 'the'.

Our response: Thanks. We revised accordingly.

(24) Referee: Line 310, change 'short period of time' to 'short period'.

Our response: We have removed this sentence after the major revisions are made in this section.

(25) Referee: Line 321, I couldn't find such data from the Table 2, but assume that the authors had converted the k unit from g/day to g/year.

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Our response: We appreciate this comment. We have revised. Please see lines 313-314 in the revised MS.

(26) Referee: Line 332, add 'in litter' after 'remaining'.

Our response: Thanks. We have made major revisions in the revised MS.

(27) Referee: Line 337, add 'the' after 'increases'.

Our response: Thanks. We have made major revisions in the revised MS.

(28) Referee: Lines 345-346, change 'the greater' to 'the greater the', change 'the faster' to 'the faster the'.

Our response: We have removed this sentence after the major revisions are made in this section.

(29) Referee: Figure 5, please present the Treatments in Fig. 5b but not in Fig. 5a.

Our response: Thank you very much. We have revised accordingly.

We hope our responses and revisions made in the revised MS are appropriate.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2018-66/bg-2018-66-AC2-supplement.pdf>

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2018-66>, 2018.