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Title: Effects of grazing on leaf traits and ecosystem functioning in Inner Mongolia grasslands: scaling from species to community

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General comments

This is an interesting paper on the characterisation of leaf traits in 8 grassland communities distributed along a soil moisture gradient. The impacts of grazing on three leaf traits (leaf area, leaf mass, specific leaf area) and on community characteristics (leaf area index, leaf biomass and standing aboveground biomass) were assessed by the comparison of grazed and ungrazed sites for 6 of the communities.

In the result's part, trait's responses are analysed per species for the common ones in the paired ungrazed and grazed sites and per plant functional groups (PFGs), testing seven different classifications. It is shown among communities, different proportions of increased, decreased or unchanged trait's values in response to grazing, and also that trait's values and trait's responses differ among PFGs. Then, LAI, leaf biomass and standing aboveground biomass are compared for the first dominant species of each community, and are also calculated at the whole community level among grazed or ungrazed sites. These variables are used by the authors to describe the ecosystem functioning. Results indicate different responses at the dominant species level but more uniform response at the community level, ie a decreased leaf biomass and standing aboveground biomass under grazing.

In this paper, a large amount of observations and measurements have been collected and many results are presented, but the way used to collect the data and the way they are analysed need to be clarified in order to improve the manuscript, the understanding of the results and their interpretations. Thus major modifications are needed before publication.

Main comments are:

Materials and methods need to be clarified for some points which could lead to modify the interpretation of the data:

- It is necessary to indicate if the grazed sites have been protected from defoliation before the period of measurement. If not, it is possible that shorter plants and lower level of standing biomass and LAI reflect the effect of partial defoliation. Were the quadrats protected from defoliation? If not, which were the rules to select the quadrats and the plants for leaf trait measurements in the grazed sites? Same questions for plant trait's measurements: which procedures were used to select plants not subjected to recent defoliation?

- The utilisation of standing aboveground biomass as a proxy of ANPP needs to be justified and clarified.

- Were dead and green material considered all together or only green material? This could have implication for assessment of standing aboveground biomass, as dead material could be less important in grazed than in ungrazed sites. This could also have an impact on leaf traits if mature

and fully expanded leaves used for traits measurements contain or not senescent tissue. This point needs to be explained and clarified.

About Data analysis

- The analyses are presented by the authors at three different levels, species, population and community. Nevertheless, it is not clear why the authors use the population level, because the data which are presented (p9956, § 3.4) are in fact data of the first dominant species in each of the grazed or ungrazed sites of the 6 communities. This needs to be clarified. What are the objectives of the presentation of the dominant species of each community?
- Trends in the results for population and community are not the same (Table5, Fig. 4). This needs to be discussed.
- Trait's responses are presented per PFG, but thereafter, the composition of communities in PFGs or the effects of grazing on PFG composition are not presented, thus, the utility of the presentation of trait's values per PFGs do not appeared as very useful to understand the results at the communities level. It could be suggested to present the distribution of different PFGs in grazed and ungrazed sites?
- Trait's values are presented per species and plant functional groups but not at the community level. It could be interesting to present mean trait's values at the community level to better inform relationships between traits and community characteristics. Questions and hypothesis on these relationships have to be better presented.
- Links between soil and communities characteristics: are soil properties significantly affected by grazing? This needs to be tested, as soil properties could directly have an effect on communities characteristics.

Minor points

- The english needs to be improved
- Redaction: too many abbreviations in the text, making it difficult to read. Also, too many symbol, for example ">" or "<". This needs to be modified.
- For a better demonstration, references need to be added. For example, p9956, after "...indicating that species with longer leaf life-span (LL) generally have less SLA values than..."; also, p9959: "...in dry habitats tend to store mineral nutrients in leaves and use a majority of them to construct protective structure...", also, p958, line 16 : reference after "...leaves to reach higher stature", ...
- 3.2 Page 9954 : are grazed and ungrazed datas pooled to assess the variations in leaf traits across PFGs?
- Table 2: Data within a column and per PFGs.....
- Table 6: in the legend: Field holding capacity, not Fielding holding capacity
- Fig. 3: the size of the symbols is too small. The same in Fig. 4
- Page 9960, line 13 $p < 0.05$, not $p > 0.05$