Dear Peng,

Thanks for your interest in our study published in BGD (bg-2016-68). Some items you mentioned in your comments are quite reasonable, which were also raised in the previous referee's comments. We would like to answer your concerned points one by one (Q, underline, and A, plain).

Line 42-44, the authors said the flower litters of phanerophyte plants were comparable with non-flower litters. To make it clear, the authors should point. The weight or something of litters are comparable. For the abbreviation, it should be mentioned for the first use, after that always use abbreviations. I suggest the authors to introduce why they also want to study P. Is N and P coupled in determining the storage and availability of soil resources?

Yes, it is dry weight. Then, "for phanerophyte plants, it was comparable of dry weight between flower litters and non-flower litters". For the abbreviation, it will be revised as you suggested. In addition to the reason to study P had been mentioned in Line 109, here are some other points; 1) according to the previous study, large quantities of tree pollen can be produced over a relatively short period in early summer (Doskey & Ugoagwu, 1989) in many temperate forest ecosystems; 2) they can play an important atmospheric source of macronutrients in terrestrial and aquatic communities for their high nutrient concentrations and high decomposition rate (Stark, 1972; Doskey & Ugoagwu, 1989); 3) in boreal forests, pollen may also be an important role in adding nutrients and promoting decomposition (Lee et al., 1996). The last point, N and P must be coupled in determining the storage and availability of soil resources since it is one core content of ecological stoichiometry.

Line 159. Are the flower litters of 29 species collected in both sites. or just 14 for one site and 15 for another?

Yes, they were collected from both sites.

Line 179. It seems you did not report the effect of leaf litter addition on decomposition.

It had been comprehensively presented in table 6 about the effect of leaf litter addition on decomposition. As we explained about the experiment design, there was one treatment about mixed leaf litter addition from alpine meadow during the blooming period.

Line 205. You should make clear how many treatments in the decomposition experiment. To me, it seems there are three. Flower litter of two species and mixture of others. I guess the two species you mentioned should belong to early and later flowering groups, respectively.

There are three treatments, which consisted of flower litter of *R. przewalskii*, flower litters of *M. integrifolia*, and mixed leaf litter. All of the above which were put into litter bags. Two species mentioned as representative species were from dominant shrub species for their wide distribution and massive flower litter production.

Line 205. Can you make it clear how to determine the weight of litter after a period of time in the litter bag?

Yes, we would like to modify and add more information in details. Firstly, remove the debris or mud outside the litter bags carefully, then litter was taken outside and sank into small water basin for short period of time (30 minute), which would go through 0.5 mm mesh filter to sort out clay and litter. Lastly, litters were dried at 60℃ in an oven for 48 hours and measured the weight on the balance (accuracy 0.001 g).

Line 254. Can you compare the flower litter proportion to whole plant biomass in the two collecting groups or five life-form groups? Do the similar comparison for size of inflorescence?

Because there are not only grasses (herbaceous plants) but some shrubs (phanerophyte plants), we could not calculate and compare the proportion of flower litter to the whole plant biomass unless the whole shrub individual were dug out, which is not practical and available. Moreover, only the whole aboveground part of grasses will wither with some parts fallen into soil for decomposition. Thus, we compared proportion of flower litter differently according to phanerophyte or herbaceous plant since the approaches of litter collection were different (litter trap or manually pluck), respectively. The information of size of inflorescence had been deleted according to the previous referee's comments. We also thought that point over for its reasonability because plants may produce smaller size but lots of flowers, and pollen mass may differ from certain species. Hope we understood your point properly.

Line 257-265. From the description in these lines, flower litter seems to account more than 60% if the non-flower litter represents biomass without flower. So please make it clear what the non-flower litter stands for, and make the difference between the non-flower litter and individual aboveground biomass

Yes, similar as the previous one. When we compared flower litter with non-flower litter, those species were phanerophyte plants but not herbaceous plants, whose litters can be collected by litter trap (the process had been added in details). Here non-flower litters represented litters in the litter traps excluding flower litters (i.e. leaf and twig). This point had been described "the flower litters of phenerophyte plants, whose flower litters …"

Line 277-278. I suggest put the F and P values after each indices. Line 293. The results you obtained based on the pooled data of all species. As you have measured the N and P of different species, can you present the results of interaction of species and different organs of plant on N and P.

Yes, we will do that. Previously, we just did pooled data of all species since the detailed information had been illustrated in Fig. 4 and Fig. 5.

Line 313. As the result shows no significant effect of interaction between flowering time and litter addition on TN and DON. If the nitrogen content and weight of flowers have no significant difference, TN and DON should have no significant difference. DIN and DNN might be the result of different priming effect of flower addition on soil mineralization rate.

We agree that "priming effect" of flower addition had effects on DIN and DNN (also see Line 479). However, in this study, TN and DON had significant differences, which can be understood if we take the species-specific size and pollen production into account (e.g. shrub, *Rhododendron przewalskii* versus herbaceous plant, *Primula orbicularis*).

Line 320. I suggest the authors put more emphasis on the DIN and DNN when investigating the effect of flower litter on soil nitrogen. As flowers have high N content, with and without litter addition should have significant difference even no experiment has been done because this relationship seem straightforward. However, for the DIN and DNN, mineralization rate might contribute to the DIN and DNN.

Yes, agree. It had been also suggested by the previous referee. We deleted DON and DIN, and combined TP and A-P together. Also, mineralization rate should be emphasized more.

Line 366. As you mentioned, in the MM section (Line 179). There should be four treatments, early flowering, later flowering, mixted leaf litter and control. I suppose you might make a typo. In line 179, it might be flower litter mixture.

From a certain extent, we agree to your point. If we address experimental design according to flowering time but not exactly different species, then there would be four treatments. However, we were considering different species from two flowering period (earlier and later), so that there should be 33 treatments (31 flower litters from different species, 1 mixed leaf litter, and 1 control, in total 33 treatments).

Line 377. Make the flowering season specific.

Ok, we will add some points about the specific flowering seasons.

Line 390. I suggest to add the information about the flower litter proportion to aboveground biomass in specific time and the whole growing season.

Please kindly see the reply to Line 254 and Line 257-265. For those herbaceous plants, the proportion of their flower litter to aboveground biomass is available unlike other shrubs.

Line 422. Did I misunderstanding something? You discussed about the effect of C/N, lignin/N on leaf and flower on their decomposition, but you just reported the decomposition results of flower litter.

Yes. Because we could not collect enough amount of leaf litters of some species during blooming period. However, some leaf litters were used for determination of chemical composition, we just compared chemical properties of dominant species between flower litter and leaf litter. In the decomposition experiment, mixed leaf litter of herbaceous plants in an alpine meadow was adopted instead of all species for the similar reason. Moreover, it can be up-front that those herbaceous plants produce more decomposable leaves for less wax and thinner cuticles than those shrubs in alpine ecosystems, at least for those species in this study.

Line 438. I am not very familiar with the P cycling in the plant-soil. I guess the A-P comes from the soil and moves to the flower, after flower fall, it goes back to soil. I mean did the plant accelerate the weathering of minerals and contribute to the increased available P in the plant-soil. If not, it is just a redistribution of A-P in plant and soil at different times in the growing season and non-growing season.

From our understanding, A-P comes from soil and will be absorbed by plant root systems. Then, P will be prioritized to reproduction organ along with the allocation of accumulated carbohydrates, which is an adaptation strategy of alpine plants in a hush environment (i.e. alpine ecosystem). It is not easy to distinguish weathering of minerals accelerated by plant or redistribution of A-P in plant and soil because the decomposition of plant litters is a long process for several growing seasons and non-growing seasons.

Line 501. I am not sure the requirement of the "Biogeoscience" to include a conclusion. It makes easier for reader to grab the major findings based on your discussion.

Thanks for you kind reminder. We will wait for editor’s recommendation.

Thanks again for your time!

Jinniu Wang on behalf of all authors