

Response to Reviewer 1 Comments

Point 1: I read with interested your manuscript but, I am sorry to say that I don't agree with your conclusion and how you interpreted your results.

In general, I think you trusted your statistical results too much and you sometimes missed the ecological significance between them. In my opinion, when you obtain some significant results ($p < 0.05$) it doesn't mean that you have to drive your conclusion only on the base of them. I am referring for example on the MDS stress or the ANOSIM (line 204-25) or the results reported from the line 230. I am sorry but I think that your conclusions are driven more by statistical results than ecology. Lines 204-5 and figure 4: statistical significance (stress) of the MDS and ANOSIM test result are not so high so your conclusions are supported by statistic but ecologically too weak

Response 1: Thanks for your strong comments on conclusions and their links with statistical analysis. We think that is because we did not clearly describe and interpret our hypothesis and conclusions. As a result, the statistical analysis seems not consistently support our conclusions. We have re-organized our hypothesis and conclusions. We assumed the environmental conditions and taxon composition should be quite similar (no significant difference) for the neighboring basins that share a common species pool, and macroinvertebrates are not dispersal limitation. We also confused to use environmental filtering and environmental selection, and now we clarify the environmental filtering is a process at regional scale, and environmental selection at local scale. nMDS and ANOSIM showed that there is statistically significant difference in composition between two basins. Although R^2 (0.194) / Stress (0.168) are not so high / low, the information is strong enough for us to know the difference against our hypothesis: no significant difference between the two neighboring basins.

Point 2: lines 217-220: please add the p-values

Response 2: We have added the p-values in line 241-243.

Point 3: line 230: Apparently the environmental factors don't explain a very high variance. Is it enough for your conclusions?

Response 3: Our studied macroinvertebrates are passive dispersal and highly dynamic in streams, the low explanatory power of environmental selection is common for such groups. We have tried to measure the potential important variables affecting the community composition in our study. High unexplained variance indicates the important role of random processes in such groups.

Point 4: line 259: you mentioned only 9 streams of Dongjiang. What about the other river?

Response 4: We have revised this sentence to "The 9 headwater streams of Dongjiang basin are located on the east side of the mountain. Compared with the west partners in the Beijiang basin, the

9 headwater streams receive higher precipitation, and they also cover a wider elevation range." In line 289-291.

Point 5: line 266: you compared species diversity with family diversity in the same context. Please better define this concept

Response 5: We have added "When identification to species is not consistently possible, family richness is used as an approximate surrogate of species richness" in line 297-298.

Point 6: lines 273-274: maybe it should be interesting to add the number of specimens you collected in order to reinforce your results

Response 6: We have added the number of collected specimens in line 305.

Point 7: line 302: a difference statistically significant but less ecological as you stated in the following sentence

Response 7: As two basins share a common species pool, the significant differences in their taxon composition of macroinvertebrates were largely from the difference in the abundances of some dominant species. The statistical difference showed environmental difference between tow basins.