

Interactive comment on “Influence of slope aspect on the microbial properties of rhizospheric and non-rhizospheric soil on the Loess Plateau, China” by Ze Min Ai et al.

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Dear Reviewer, We are very glad to receive the comments to our manuscript se-2017-137, entitled “Influence of slope aspect on the microbial properties of rhizospheric and non-rhizospheric soil on the Loess Plateau, China”. The comments from the reviewer are very helpful for revising and improving our manuscript, as well as hold great guiding significance to our researches. We take all of these comments into account in preparing the revised manuscript. We believe that the manuscript has been improved satisfactorily and hope it will be accepted for publication in Solid Earth. We thank again the reviewer for the works that you have done for our paper. If you require any further

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information, please contact with us at any times.

General comments The manuscript investigated the influence of slope aspects (south-facing, north-facing, and northeast-facing slopes, all with *Artemisia sacrorum* as the dominant species) on RS and NRS microbial biomass carbon (MBC) and phospholipid fatty acid (PLFA) contents, and the rhizospheric effect (RE) of various microbial indices. Using redundancy analysis (RDA) and path analysis, the authors quantified the driving factors controlling the rhizospheric soil (RS) and non-rhizospheric soil (NRS) microbial properties. I think the study is quite interesting, however, I think a total of 18 soil samples (3 sites 3 plots per site 2 soil types) were not enough for redundancy analysis, and the number of soil samples is not enough for evaluating the influence of slope aspect on the microbial properties of rhizospheric and non-rhizospheric soil, it will be perfect to take more soil samples at different slope gradient. Overall I think the paper will be of interest to soil readers. However, it needs considerable work, though, before it's ready for publication in the field. That work includes better organization of manuscript (especially Introduction section) and more sampling for the results. More importantly, The English in the paper needs considerable editing. Here are some more specific suggestions to improve the manuscript in a revised version. R: We are very grateful to the reviewers for the recognition, and totally agree with the reviewer's comments. As the reviewer's comments, the plots in our paper were not very enough to explain the effect of slope aspect on the microbial properties of rhizospheric and non-rhizospheric soil, in a certain extent. However, the purpose of this paper was to emphasize that the slope aspect plays a key role in the study of rhizosphere microorganism, and to provide some new ideas for scientific research in a related field. In addition, the field survey in this paper was conducted in September 2014, so the plant community in the study area has now changed, looking for a new gradient of slope aspect was very difficult (other geographical factors as consistent as possible with the previous ones.) in the study area. Actually, we also tried to investigate more slope aspects in the investigation at 2014, but under the conditions of the same site conditions and plant species, the three slope aspects have been chosen in the paper: same site conditions, same

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dominant species, and geographical proximity. The location of the three sites were marked in another article (Ai, Z. M., He, L. R., Xin, Q., et al. Slope aspect affects the non-structural carbohydrates and C: N: P stoichiometry of *Artemisia sacrorum* on the Loess Plateau in China, *Catena*, 152, 9-17, 2017). Figure was shown in the below, Fig. 1. To summarize, we hope that the reviewer consider the field test conditions, and give us a chance to express the standpoint in this article. The paper has been re organized as suggested by the reviewer, especially the introduction part. This paper has been re-edited by the English editor. We are very grateful again to the reviewer for sincere comments, and these suggestions are very important to our future research work.

Specific comments Lines 35: the first word “Slope aspect is an important topographic factor,” is not incomplete. R: Considering the reviewer’s suggestion, we have changed this sentence into “Slope aspect is an important topographic factor in the micro-ecosystemic environment”. Lines 35

Line 55: the sentence “the angle between the ground and wind direction, which is defined as the orientation faced by a slope” can be deleted. R: After carefully considered the reviewer’s suggestions, we have deleted this sentence. Line 56-57

Line 61-65: the sentences move to the behind of the first sentence of this paragraph, or suggest delete. R: As suggested by the reviewer, we have already put this sentence to behind of the first sentence of this paragraph. Line 59-63

Line 64- 69: the two sentences don’t connect well. R: We totally agree with this comment, and apologize for our carelessness. We have added the new sentences between the “two sentences”: “Previous research indicated that slope aspect markedly affects soil and microbiological properties in micro-ecosystemic environments. The results of studies on the impact of slope aspect on the microbiological properties, however, are not consistent”. Line 68-70

Line 68-72: suggest summarize these sentences. R: As suggested by the reviewer, we

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have added a sentence in the manuscript: “The influence of slope aspect on microbial characteristics has obviously been variable in these studies, and the differences may be caused by the differences in plant species (trees vs shrubs), soil properties, climatic conditions, and research methods”. Line 76-78

Line 70: unclear statement. R: We have revised this sentence to make it clear: “other studies have found that the MBC, fungal, and total phospholipid fatty acid (PLFA) contents in the south-facing slopes were significantly higher than those in north-facing slopes”. Line 72-74

Line 108-109: unclear statement. R: We have rewritten this sentence to make it clear: “Under the conditions of different slope aspects, the effect of the main soil nutrient factors on RS and NRS microbial communities on local micro-ecosystemic environments, however, remains unclear”. Line 112-114

Line 121-122: unclear statement. R: We have rewritten this sentence to make it clear: “soil carbon (C) and nitrogen (N) are the main soil nutrient factors that affect RS and NRS microbial communities under different slope aspects”. Line 126-128

Line 185: suggest “Impacts of slope aspects on...” Line 192: suggest “Impacts of slope aspects on...” R: As suggested by the reviewer, we have revised those in the manuscript. Line 191, 198

Line 186-188: place the “Fig” in order. R: We have placed the “Fig” in order in the manuscript. Line 192-194

Line 232-235: unclear statement. R: We have changed this sentence into “Among the seven environmental factors, WNO3 content was the most significant and explained 34.7% (P=0.04) of the total variance”. Line 238-240

Line 239, 245: “standardised path coefficients are shown in” suggest delete. R: We agree with this suggestion and have deleted the “standardised path coefficients are shown in” in the manuscript. Line 243, 250

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Line 702: please give the full name of WSOC, SOC, SAP... R: We are very sorry for our negligence and have added the full name of WSOC, SOC, SAP ... in the manuscript. Line 705

Please also note the supplement to this comment:

<https://www.solid-earth-discuss.net/se-2017-137/se-2017-137-AC1-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2017-137>, 2018.

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Fig. 1. The location of the experiment sites. ARSSWCCAS = Anshui Research Station of Soil and Water Conservation of the Chinese Academy of Sciences.

Fig. 1.

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