

Interactive comment on “Ecosystem-specific selection of microbial ammonia oxidizers in an acid soil” by M. Saiful Alam et al.

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Dear Editor and the reviewers

We first of all thank you very much for the time reviewing our manuscript.

We feel that the original title is too big to be supported by the experimental evidences in this study, i.e., Ecosystem-specific selection of ammonia oxidizers in an acid soil. It has been changed as ‘Conversion of aerobic upland to flooding paddy field alters community structure of archaeal ammonia oxidizers in an acid soil’

We acknowledge that it is not appropriate to hand the entire argument on the oxygen as the ecological force driving the shift of AOA communities in the acid soils tested. It has been rephrased throughout the manuscript. In the meantime, we do believe

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that this study represents an important attempt to evaluate the mechanisms for niche differentiation of AOA communities in complex environment.

What we know for sure in this study is that AOA within the soil group 1.1b lineage dominate the communities of archaeal ammonia oxidizers in an upland acid soil; and AOA within the soil group 1.1a lineage predominate in paddy soil. This paddy soil was converted from upland acid soil more than hundred years ago, and both soils are of the same origin with only ~100 meters away from one another.

What we are not sure is the environmental factor that leads to the diversification of AOA communities from the group 1.1b in upland soil to the group 1.1a in paddy soil. The most striking difference between upland and paddy fields are flooding management. However, we could not exclude the possibility that other environmental factors may have a say. Therefore, the balanced discussion was made in the revised manuscript.

We strongly believe that speciation of AOA communities could not be done overnight. For example, if we were able to collect and concentrate the AOA cells of the group 1.1a lineage from sea water and put it into the upland soil, it seems unlikely that these marine AOA would be shifted to soil group 1.1b lineage. Therefore, our study highlights the importance of long-term field experiment for revealing the niche differentiation of ecologically important microbial guilds in complex environment.

Thanks for your attention and comments to our manuscript

Yours sincerely

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