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Biogeosciences
Discussions

Interactive comment on "Evaluating the response of δ^{13}C in *Haloxylon ammodendron*, a dominant C_4 species in Asian desert ecosystem, to water and nitrogen addition as well as the availability of its δ^{13}C as the indicator of water use-efficiency" *by* Zixun Chen et al.

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Thank you for your comments! Indeed, we also recognized that differences in temporal scale may lead the carbon isotope composition (δ13C) to be irrelevant to water use efficiency (WUE). Yet we think our conclusion should be believable, because both water addition and N addition changed the WUE of H. ammodendron, but δ13C did not show variability across water and N treatments. We will discuss this uncertainty in

subsequent revisions. We agreed with your comments that utilization of groundwater leads to the insensitivity of H. ammodendron to rainfall and water addition. In fact, we have found that the root of H. ammodendron can be inserted into the soil layer deeper than 3 m, which makes it easier to absorb groundwater. Thus, this is one of the mechanisms behind our observed results. We will try our best to supplement plant water source information and meteorological information in subsequent revised editions, and discuss their influence on our results. Thank you very much for your suggestion. The photo flux density is 1600 mmol m-2 s-1 in our measurement. We considered that it is more suitable for measuring gas exchange in H. ammodendron, which grew up in a desert area with high light intensity. The 1000 mmol m-2 s-1 written in the previous version is our clerical error. Thank you for picking out our errors. The meaning of "kept stable" is that leaf temperatures were within the range of 29.5 °C to 30.5 °C during the entire period of gas exchange measurements. We will check our manuscript carefully and improve our writing in subsequent revisions.

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