

SOIL Discuss., referee comment RC1
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Comment on soil-2021-40

Anonymous Referee #1

Referee comment on "Soil $\delta^{15}\text{N}$ is a better indicator of ecosystem nitrogen cycling than plant $\delta^{15}\text{N}$: A global meta-analysis" by Kaihua Liao et al., SOIL Discuss.,
<https://doi.org/10.5194/soil-2021-40-RC1>, 2021

Based on 79 and 76 paired observations for soil and plant $\delta^{15}\text{N}$ from 20 published studies, the authors applied a global meta-analysis method to evaluate the influence of the global warming on soil and plant $\delta^{15}\text{N}$. This work is helpful for readers and can be useful in the study of ecosystem nitrogen cycling. The topic of this manuscript fits well under the scope of "SOIL". Moreover, it is well written and figures are of high quality. In my view the paper should definitely be published in "SOIL" with a moderate revision. However, the following comments should be taken into account before acceptance.

Major comments

- In this paper, few literatures (only 20 papers) were selected for meta-analysis. Fortunately, there are 79 and 76 paired observations for soil and plant $\delta^{15}\text{N}$, and I believe that these samples are enough for meta-analysis. However, the manuscript lacks of important information on soil, such as organic matter content.
- The Introduction section still needs to be improved to clarify the key scientific issues. Such as, one of purpose of this study is to identify the main factors influencing the warming effect on the soil and plant $\delta^{15}\text{N}$. In fact, since a relatively large number of investigators from around the world were involved in the 20 studies that were selected, there is no indication that all these studies used similar protocols, and coordinated their experimental conditions. For example, we know that soil water content has an impact

on soil and plant $\delta^{15}\text{N}$, and also impacts the analysis results. The authors should check what is the cause of the differences between soil and plant $\delta^{15}\text{N}$?

- The M & M section is a little rough and please reorganize this section to make it more clearly. Please provide detailed soil information which appeared in this section.

- The Discussion section, which is the most important part, is relatively weak because the contents and explanations are not well organized and are still not convincing. Less descriptive of results and more mechanism discussion are encouraged in this section. More references should be added to the discussion section.

Specific comments

Line 12: The nitrogen-15 (^{15}N)...

Line 14: global warming -> experimental warming

Line 15: for -> of

Line 29: ...soil $\delta^{15}\text{N}$ was more effective than plant $\delta^{15}\text{N}$ in indicating....

Line 40: cycle -> cycling

Line 48: becomes a useful tool -> is often used

Line 68: In addition to soil warming, air warming was also conducted.

Line 93: more than 50? Please specify

Line 99: can be obtained -> were provided

Line 109: Did you do resampling with bootstrap? What are the resampling times?

Line 122: Mean effect sizes: This concept was not specified earlier. I think that it is technique, soil type, warming treatment... . Is it so? Please, clarify

Line 154-159: The authors should add more references to support this statement.

Line 160-164: Is that true? There were two kinds of ^{15}N , three soil acidity-alkalinity types, three vegetation types, and three warming treatments groups. Were there enough number of observations for these groups? For example, for plant $\delta^{15}\text{N}$, there were only 9, 3 and 2 observations for acid, neutral and alkali, respectively.

Line 167: add a reference here

Line 182-184: awkward sentence

Line 185: If you want to use "significantly", you have to give the P value.

Line 188: Add a reference.

Line 211: when investigating -> in order to better investigate