Dear Editors:

Thank you very much for giving our chance for further revision, and your comments along with the reviewers' ones regarding our manuscript entitled "Soil microbial diversity and network complexity promote phosphorus transformation – A case of long-term mixed plantations of *Eucalyptus* and nitrogen-fixing tree species" (ID: egusphere-2024-3456). We have carefully studied your comments and made thorough revisions which have taken full considerations of your comments and suggestions.

The detailed responses for each of your comments are as follows:

1. Title and L35: Add "a" before "nitrogen-fixing tree species".

Response: Added (L2 and L27).

2. L109-132: I think much of this section should be separated into its own paragraph, separate from the last one that lists the specifics of this study, the questions, and the hypotheses (which are now clear). Additionally, I would suggest some editing of the added text here as there is some repetition (i.e., the sentence on L 127-130 repeats some information from L118-122).

Response: Thanks for pointing these out. We have carefully checked the entire paragraph again and removed L127-130 which repeats some information from L118-122.

3. L113-115: Can "reductions in soil nutrient effectiveness (e.g., the availability of nutrients such as N, and P in forms that can be absorbed and utilized by plants)" be changed to "… reductions in plant-available soil nutrients…"

Response: Changed (L114-115).

4. L121-122: Epihov et al. 2021 is an inappropriate citation for this sentence. It reports the effects of N fixers on mineral nutrients in regrowing tropical forests, not the role of N fixers on N uptake and woody production in Eucalyptus plantations.

Response: Deleted.

5. L125-127: Can you provide citations for this sentence?The last paragraph of the introduction should probably list the N-fixing tree species used in the study (Acacia mangium). There are many N-fixing tree species used in agroforestry, and they likely vary in their effects on neighboring non-fixing trees.

Response: L125-127 have been removed due to it is redundant / unnecessary sentence here. Meanwhile, we have listed the N-fixing tree species used in the study (*Acacia mangium*) in the last paragraph of the Introduction (L129-135).

6. L174-175: Can you provide citations for the previous studies being referred to?

Response: Added (L180-181).

7. L286: When reading Henseler and Sarstedt 2013 I could not find a statement stating that the goodness of fit index (from Tenenhaus et al. 2004) with a value > 0.7 indicated a good model fit. I could not find a "benchmark" that lists a good model fit.

Response: Thanks for pointing these out. We have carefully checked the related references throughout and found there were some citation errors of *Data analyses*. Further, we have corrected it in the revised manuscript (L293).

8. L290: Change "Significant" to "Significantly".

Response: Changed (L298).

9. L339: If I understand the response to my previous comment (first round of reviews) correctly, the authors are stating that pH is the most important regulator because it has the lowest p value. The p value cannot be used to determine how important a regulator (pH) is relative to other regulators (it doesn't directly map onto how much of the variance is explained by that predictor). I believe you can however use the length of the arrows to determine which regulators are more important than others.

Response: Thanks for the comments. We have carefully checked the entire paragraph and made appropriate (L340-347).

10. L427-428: The goodness of fit (Tenenhaus et al. 2004; Hensler and Sarstedt 2013) is similar to, but a bit different than the proportion of variance explained. Instead, it is the geometric average of the "average communality", i.e., the average proportion of variance explained when regressing the reflective indicators on their latent variables (the measurement model quality), and the mean block R^2.

Response: Thanks for pointing these out. We have carefully checked the related data analyses throughout and made necessary modification to avoid confusion (L433-436).

11. L515: It is unclear what is meant by "significant phylum".

Response: Thanks for pointing this out. We have corrected the description to avoid confusion (L523-525).

12. L517: Rhizobia are not Actinobacteria.
Response: Corrected (L525).

Once again, we would greatly appreciate Editors/Reviewers' comments and suggestions, and we believe this revision is much improved as a result of our modifications. Please let us know if there is anything else we can do to help the review process.

Thank you for your time and consideration.

Yours sincerely,

Xueman Huang