

## **Point-by-Point Response (in italic) to Reviewer's Comments**

Title: Status and influential factors of soil nutrients and acidification in Chinese tea plantations

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Note: all the revised parts have been highlighted in red in the revised manuscript.

### **Overall comment**

This paper systematically analyzes the contents of organic matter (SOM), nitrogen (N), potassium (K), phosphorus (P), and pH levels in tea plantation soils. It explores the spatial variations and influencing factors, offering suggestions for mitigating soil acidification and recommending potassium fertilizer application strategies for tea plantations in southern and/or high-altitude regions to support sustainable management. The article has a clear structure, detailed data, and comprehensive analysis, making it highly valuable academically and practically. However, during the review process, I believe the following aspects need further improvement:

*Response:* Many thanks for your positive comments and valuable suggestions. The manuscript has been revised according to your valuable comments and suggestions.

### **Comment 1**

The title should be revised to "Status and Influential Factors of Soil Nutrients and Acidification in Chinese Tea Plantations: A Meta-Analysis," as it is based on data from literature searches.

*Response 1 :* Many thanks for your suggestion. The title has been revised.

### **Comment 2**

All major figures should not be placed in the appendix, especially those representing national-level meta-analyses of tea research; additionally, some tables could be selected as supplementary tables.

*Response 2:* Many thanks for your suggestion. Figures originally in appendix were moved to manuscript after revision by integrating information in Table 3 into Figure 2-6. Then, Table 3 were deleted from the main text. Figure S1 originally in supplementary material were also moved to manuscript after updated by enlarge the map to only contain the study areas. Detailed revision refers to the newly added Figures in the revised manuscript.

### **Comment 3**

The format of all tables needs to be modified and adjusted.

*Response 3 :* Many thanks for your suggestion. Tables in the original manuscript was presented based on the format in the template offered by Sage. However, the contents of some tables were long making it difficult to present in portrait format. In this case, Table 5 and 6 in the original manuscript were split into four tables in the revised manuscript, please see the revised Table 4 – 7.

#### **Comment 4**

The second and third paragraphs of the Introduction discussing the research progress on pH and nutrients can be improved—either merged into one paragraph or separated into distinct sections.

*Response 4:* Many thanks for your comments and suggestion. The second and third paragraph of the Introduction were merge into one paragraph.

#### **Comment 5**

The arrangement of figures and text in the Results section needs to be organized properly, such as in Table 6.

*Response 5:* Many thanks for your comments and suggestion. Table 3 was removed from the manuscript after integrating its information into Figure 2–6. Table 5 and 6 in the original manuscript were split into four tables in the revised manuscript, please see the revised Table 4 – 7. As suggested earlier by the editor, only one decimal digit of values was kept both in tables and main text to improve the readability. Detailed revision refers to the revised tables and values.

#### **Comment 6**

Section 4.1 in the Discussion is overly lengthy; I recommend streamlining the language.

*Response 6:* Many thanks for your comment and recommendation. The Section 4.1 has been revised to be more concise.

#### **Comment 7**

It would be beneficial to include a section on the limitations of this study

*Response 7:* Many thanks for your suggestion. A section discussing the limitations, uncertainties and future looks were added in the revised manuscript. Detailed revision please see the newly added section 4.4.

#### **Comment 8**

In-depth research on mechanisms: While the article highlights various environmental factors and management practices affecting tea plantation soils, further investigation into the specific mechanisms

and pathways of these influences is necessary. For instance, research should focus on how different fertilizer amounts and application methods impact the dynamic changes in soil nutrients.

*Response 8:* Many thanks for your comments and suggestions. To investigate the mechanisms of the environmental factors and management practices affecting tea plantations soils, more detailed data, especially from controlled experiments, containing physical, chemical and biological interaction processes in soil and rhizosphere is needed. However, at this stage, the available data we collected cannot sufficiently support the investigation of these interaction processes at national level, and we acknowledged this limitations of our this research in the added section 4.4 in the revised manuscript. Even though, investigating the amount and methods fertilizers applied is our next research topic. We already conducted an experiment on the effect of different amount and application method of organic and compound fertilizer on the physiochemical and biological characteristics of soil in tea plantation. We also started to collected data from literature to explore how different management practices, such as intercropping pattern and fertilizer modes, influence soil fertilities in tea plantations. Hopefully, our following researches can fill these gaps.