

Dear Reviewer:

Thank you for your comments concerning our manuscript, those comments are all valuable and very helpful for revising improving our paper, as well as the important guiding significance to our researches. We have studied the comments carefully and have made correction which we hope meet with your approval. Revised portion are marked in red in the paper. The responds to your comments are as follows.

1. Please provide a "reagents and chemicals" section.

Response: Thank you very much for your valuable advice. This manuscript is not a study based on the results of chemical experiments, so it does not cover the "reagents and chemicals" section.

2. Did you analysed the sample in duplicate (at least)?

In the process of sample collection, we collected samples from multiple substrates (stones) at the same time and mixed them together for analysis.

3. Please add a reference here.

Thank you for your valuable comments, this part of the description is quoted in a Chinese literature (attached). DUAN Maoqing, DU Xia, PENG Wenqi, et al. Environmental characteristics analysis and background value identification of surface water reserve in Heilongjiang Province[J]. Environmental Chemistry, 2021, 40 (6) : 1763-1774.

4. From my point of view, the mentioned reference is not enough. Please present these indices: what are they calculated for, what are the variables they take into account, what are the differences between them, etc.

Response: Thank you for your valuable comments. All descriptions of the diatom indices selected in this article can be found on the Omnidia's official website. The relevant information has been attached to the manuscript. "An introduction to these 18 diatom indexes can be found on Omnidia's official website (<https://omnidia.fr/en/>)." (In red)

5. "The discriminant ability of the diatom index in the Tangwang River Basin was judged by the box diagram method" which implies what?

Response: Thanks for your valuable comments, we have added the following instructions to the manuscript. "a high score indicates that the diatom index can effectively distinguish between different ecological health conditions." (In red)

6. "The accuracy score of each diatom index = $(a + b)/2$." Please put this using the equation function

Response: Thank you for your valuable comments, we have made corresponding changes in the manuscript.

7. Please explain how it was calculated Shannon diversity index.

Response: Thank you for your valuable comments. We have added the calculation process of the Shannon diversity index and Pielou evenness index.

The Shannon diversity index (H') is a comprehensive species richness index and a measure of the distribution uniformity for individuals that reflects the degree of community complexity and the stability of community structures. Pielou evenness index (J) reflects the distribution evenness of individuals among species [13].

$$H' = - \sum (n_i/N) \times \ln(n_i/N)$$

$$J = H' / \ln S$$

Where n_i and N represent the number of individuals representing species i and the total number of all species, respectively, S represents the number of species.

8. “Please maintain a uniform expression: Figure 2, figure 2, Fig.”

Response: Thank you for your valuable comments, we have made corresponding changes in the manuscript.

9. “the box plot scores between the reference group and the mild damaged group were ≥ 2 .” and what does this value mean?

Response: Thank you for your valuable comments, we have added the following instructions to the manuscript. “which indicates that the reference group and the mild damaged group can be effectively distinguished by the above diatom indices”.