



REVIEW

of the Ph.D. thesis of

BASSAM HUSSEIN IBRAHIM ABUBAKER

entitled

“Revealing diatom diversity, rare taxa and their environmental drivers through complementary eDNA metabarcoding and microscopic approaches”

The thesis of Bassam Hussein Ibrahim Abubaker addresses an important and timely research topic, since the importance of environmental DNA-based approaches in ecosystem monitoring is increasing. The experimental work is well designed, the methodologies applied are appropriate, and the results are comprehensively evaluated and discussed.

Being the reviewer of the preliminary version of the thesis, I can confirm that the final version represents valuable and important research. Overall, the thesis is well structured, coherent, and easy to read. Only a small number of grammatical and typographical errors remained in the text.

Several of my suggestions concerning have been incorporated into the revised version of the dissertation or were added to the thesis booklet. The figures have been improved, they are clear, and informative in the final version. The General Discussion chapter and the detailed description of the candidate’s personal contribution have been added.

The relevant scientific literature has been thoroughly reviewed, and the research objectives are clearly formulated. The experimental methods are up-to-date, and appropriate for addressing the research questions. The conclusions from the results are well supported, and the main findings are discussed in detail in relation to the relevant literature. The candidate has demonstrated relevant publication activity associated with the dissertation.



The work contains novel scientific results that contribute to the field; therefore I accept all of the theses presented in the thesis booklet. I recommend the acceptance of the dissertation and the statements formulated in the thesis points.

Questions:

1. Traditionally, diatoms are still playing a prominent role in water quality assessment and other applications, such as paleolimnology and forensic investigations, due to their diverse morphological characteristics and well-preserved silica cell walls. Could you suggest another algal group that could potentially replace diatoms in eDNA-based water quality assessment and provide more accurate information?

2. Is there an explanation for why the *rbcL* gene was selected as the primary taxonomic marker for diatoms, while the 18S rRNA gene or ITS is used for other groups of algae?

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