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OPINION

on PhD thesis (dissertation) for the Doctor of Philosophy (PhD) academic degree in the field of higher education 4. "Natural Sciences, Mathematics and Informatics"; professional field 4.3. "Biological Sciences"; scientific specialty "Hydrobiology"

Prepared by: Dr. Yanka Nikolova Presolska, Associate Professor at the Institute of Biodiversity and Ecosystem Research at the Bulgarian Academy of Sciences, Department of Aquatic Ecosystems, member of the scientific jury appointed by order No. 16/14.02.2025 of the Director of IBEI-BAS-Sofia.

Author of the dissertation: Mila Kirilova Aleksandrova-Ihtimanska

Тема: „COMPOSITION, STRUCTURE AND DISTRIBUTION OF THE MACROZOOBENTHOS IN THE RIPAL ZONE OF THE BULGARIAN SECTION OF THE DANUBE RIVER SECTION UNDER ANTHROPOGENIC IMAPCT AND PRESSURE", scientific supervision – Assoc. prof. Luchezar Pehlovanov, PhD.

Defense documents

For the defense procedure, the PhD student has submitted all necessary materials and documents specified in the Rules on the terms and conditions for acquiring scientific degrees and for occupying academic positions at IBER-BAS.

General impression of the dissertation

The macrozoobenthos community in the main stretch of the Danube River, the adjacent wetlands and tributaries on the territory of Bulgaria has been the subject of numerous studies of varying intensity from the 60's of the last century to the present days. At the same time, there is a lack of a more comprehensive analysis of the anthropogenic pressure in the Bulgarian section of the Danube River. The presented dissertation fills this gap, which makes it particularly relevant. It contains a multi compound analysis of the composition, structure and distribution of the macrozoobenthos communities in Bulgarian section of the Danube River, in the context of the existing anthropogenic pressure. The author also upgrades the topic with an in-depth analysis of the influence of water level fluctuations on the distribution of macrozoobenthos in the riparian zone of the Bulgarian section of the Danube River.

In terms of its structure, content and volume, the dissertation fully complies with the requirements for dissertations for the acquisition of Doctor of Philosophy (PhD) academic degree. It has a total volume of 213 pages and contains the following chapters: introduction (2 p.), literature review (25 p.), goal and objectives (1 p.), materials and methods (18 p.), results and discussion (75 p.), summarized results (5 p.), conclusions (3 p.), contributions (2 p.), list of literature used (21 p.) and appendices – in total 12 (40 p.). It is very well illustrated, containing 32 tables and 55 figures. The abstract has been prepared in accordance with the requirements and presents the results obtained on the topic of the study in an optimal ratio.

Opinion on the significance and persuasiveness of the results obtained, the interpretations and conclusions, and on the nature of scientific contributions

Degree of knowledge of the problem: The large number of literary sources (total 240) analyzed in the literature review and cited during the interpretation of the results, unequivocally proves Mila Ihtimanska's good awareness of the topic being developed. The author has skillfully selected the topics in the review, which helps her to substantiate the logic of her research.

Aim, tasks, hypotheses and research methods - compliance of the chosen research methodology with the set goal and objectives of the dissertation work: The goal and tasks are clearly formulated. I positively assessed the presentation of a working hypothesis with specific research questions. The analysis methods are precisely selected with a view to fulfilling the tasks set and are explained in detail. The material collected during the study is sufficient, but the use of available historical data for comparative retrospective analysis makes it possible to draw substantiated conclusions regarding the degree of change in macrozoobenthic communities in the Bulgarian section of the Danube River.

Discussion of the results and used literature: Mila Ihtimanska demonstrates in-depth knowledge of the research topic, which is a good basis for a logical interpretation of the results obtained of her own study in the context of historical data.

Contributions of the dissertation work: Based on the results obtained, the author has made a total of 6 contributions, two of which were original, confirmatory and scientifically applied. I find the contributions particularly valuable, as they cover the various aspects of the research and are an expression of in-depth analysis and interpretation. The generalizations are logical, and the conclusions are precisely and clearly formulated.

Assessment of the personal participation of the author in the contributions: The dissertation clearly distinguishes the data (respectively results) of the author from the data used for comparison and derivation of trends from previous studies and publications. Innovative and original elements are included in the analyses, and this gives me reason to believe that the dissertation is a personal work of Mila Ihtimanska.

Assessment of the quality of scientific papers and citations: Two publications on the topic of the dissertation are presented. The first directly concerns the topic of the study, presenting preliminary results from the studies and specifically the distribution of the main macrozoobenthos groups along the Bulgarian section of the Danube River in relation to the load with nutrients, heavy metals and arsenic. A list of 12 citations is attached, which is evidence of the relevance of the published results. The second publication is a full-text printed report - an analysis of the response of chironomids to pollutants in the environment of the Danube River at the community, phenotype and genome levels. Mila Ihtimanska is the first author in both publications, which proves her leading role in the conducted research.

Conclusion

The dissertation work of Mila Ihtimanska is completed at a high level and has original scientific and applied scientific contributions in the field of aquatic ecology, and particularly the influence of various factors on the state of macrozoobenthic communities in larger rivers. By developing this dissertation, Mila Ihtimanska proves her in-depth theoretical knowledge on the topic and demonstrates skillful handling of modern methods of data analysis (including statistical). She possesses the necessary qualities and skills to conduct independent scientific study. I believe that the dissertation meets the requirements set out in the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the Law on the Development of Academic Staff in the Republic of Bulgaria

and the Regulations on the Conditions and Procedures for the Acquisition of Scientific Degrees and for the Holding of Academic Positions in IBER-BAS. Based on the above, I evaluate the dissertation **POSITIVELY** and propose to the members of the Scientific Jury on the procedure to award **Mila Alexandrova-Ihtimanska** the educational and scientific degree "**DOCTOR**" in the scientific specialty "Hydrobiology".

12.05.2025 г. Prepared by:

(assoc. prof. Y. Presolska, PhD)