

STATEMENT

by **Anelia Mihaylova Stojanova, PhD**

Associate Professor at the Department of Zoology, Faculty of Biology, University of Plovdiv "Paisii Hilendarski"

of a dissertation for awarding the educational and scientific degree "**Doctor of Philosophy**"

Field of higher education: 4. Natural sciences, mathematics and informatics

Professional direction: 4.3. Biological Sciences, Doctoral program: Zoology

Author: Dimitar Vasilev Popov

Topic: "Abundance and distribution of cetaceans (Cetacea) in the Bulgarian territorial waters of the Black Sea"

Scientific supervisors: **Assoc. Prof. Dr. Hristo Dimitrov** - "Paisii Hilendarski" University of Plovdiv", **Assoc. Prof. Dr. Marina Panayotova**, Institute of Oceanology at the Bulgarian Academy of Sciences

1. General presentation of the procedure and the doctoral student

By order No. RD-21-1554 of 21 July 2023 of the Rector of the "Paisii Hilendarski" University of Plovdiv, I have been appointed as a member of the scientific jury to ensure a procedure for the defense of the PhD thesis entitled "Abundance and distribution of cetaceans (Cetacea) in the Bulgarian territorial waters of the Black Sea", in the field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences, Doctoral program Zoology. Author of the PhD thesis is Dimitar Vasilev Popov – full-time PhD student in Zoology Department of Faculty of Biology at "Paisii Hilendarski" University of Plovdiv, with scientific supervisors Assoc. Prof. Dr. Hristo Dimitrov - "Paisii Hilendarski" University of Plovdiv" and Assoc. Prof. Dr. Marina Panayotova, Institute of Oceanology at the Bulgarian Academy of Sciences.

The presented set of materials by Dimitar Popov in electronic form is in accordance with an Article 36 (1) of the Regulations for the Development of the Academic Staff of the University of Plovdiv, includes all the necessary documents described in the application to the Rector of the "Paisii Hilendarski" University of Plovdiv. The documents are prepared and presented correctly and accurately.

The PhD student has submitted 5 scientific works published in the internationally renowned peer reviewed scientific journals, indexed in the Web of Science and Scopus

databases: one paper in *Diversity* (Q1, c IF = 2.4), one paper in *Frontiers in Marine Science* (Q1, c IF = 3.7) and three papers in *Acta zoologica bulgarica* (Q3 and Q4, IF (2020) = 0.448 and IF (2021) = 0.362).

Dimitar Popov graduated at “Paisii Hilendarski” University of Plovdiv “as a bachelor's degree in Economy in 2003 and in 2013 r. he obtained a Master's degree in Ecology at University of Plovdiv. From 2020 to 2023, he was a full-time PhD student at the Department of Zoology of Faculty of Biology at the University of Plovdiv “Paisii Hilendarski”.

As a PhD student, Dimitar Popov has participated in international conferences and workshops for monitoring and protection of marine mammals. Since 2005, he has worked in Green Balkans organization, where he develops activities as a project manager related to the protection of animal diversity in Bulgaria, participates in the development of plans for the management of protected areas and other environmental protection activities.

2. Relevance of the topic

The dissertation work of Dimitar Popov is dedicated to the study of three subspecies toothed whales of family Delphinidae and family Phocoenidae, which are endemic for the Black Sea and have high conservation status. The lack of complete data on their abundance and distribution in the Bulgarian territorial waters of the Black Sea and, on the other hand, the need to take adequate activities for their protection and the assessment of the various threats to their existence outline the relevance of the study. The conducted research is pioneering, and the proposals made to the competent authorities for the protection of cetacean mammals in the Black Sea make the results of the dissertation work very valuable and applicable in conservation and nature protection activities

3. Comprehension of the research question

The literature review of the dissertation thoroughly presents the published research on the topic to date, and the PhD student demonstrates skills in analytical summaries and critical evaluation of literary sources. In his work, Dimitar Popov refers to 205 sources from the literature, of which 55 are in Cyrillic. The carefully curated and summarized information shows the in-depth and purposeful preliminary theoretical preparation of the PhD student and motivates the aim, objectives and specific approaches necessary for the realization of the dissertation research.

4. Research methodology

Classical and modern approaches for ecological and population studies were applied in fulfilling the aim and objectives of the study. For the completion of the planned research for

the dissertation work, a huge amount of data was collected and processed in a six-year period, which is a solid base for analyses. Modern software packages and statistical methods were used to process the information. The appendices to the dissertation accurately present all raw data.

It can be concluded that the methods selected and used in the development of the study are appropriate to the stated objectives and were used correctly throughout the work.

5. Characterisation and evaluation of the dissertation work and additional contributions

The dissertation work of Dimitar Popov contains 334 pages, it contains 105 tables, 205 figures, 20 pictures and 4 appendices, and is written according to outlined regulations. The PhD student refers to 205 sources from the literature, of which 55 are in Cyrillic. The results are presented and systematised in accordance with the aim and objectives. The dissertation is written in a very good language and style.

The analysis of the results is thorough and logically leads to clearly formulated summaries and conclusions; the original and applied scientific contributions of this work are significant, which can be broadly defined as:

Original scientific contributions:

An up-to-date assessment of the abundance of the three subspecies of cetaceans, the subject of the study in the dissertation, was made for a 6-year period using the line transect distance method in the Bulgarian territorial waters of the Black Sea.

The results for relative abundance (density) and distribution of the subspecies are summarized and analyzed. Seasonal population surveys were conducted and subspecies concentration areas were mapped. A study of the frequency of presence of cetaceans in the coastal waters of the Black Sea was conducted using a passive acoustic method, and the suitability of the remote linear transect method from a vessel for conducting such type of studies in marine zoology was demonstrated. The importance of the photo-identification method for characterizing the areal of the *Aphala* has been proven.

Applied scientific contributions:

For the first time in Bulgaria, an assessment has been made of the annual level of porpoise bycatch in turbot fishing in the Bulgarian waters of the Black Sea. The only catalog of individuals through photo-identification of dolphins in the Bulgarian waters of the Black Sea has been created and maintained. Three models of acoustic deterrent devices have been tested to reduce the level of bycatch of porpoises in bottom nets for turbot fishing, and recommendations have been made to the competent authorities - EAFA and MOEW.

In the dissertation, special recommendations have been made regarding the protection of the populations and habitats of Cetaceans in the Bulgarian territorial waters of the Black Sea, which I find very useful and I warmly recommend that they reach the competent authorities for undertaking adequate activities of conservation significance. Similar type of conservation activities are recommended to be applied throughout the Black Sea region to obtain real conservation results.

6. Assessment of publications and personal contributions

Dimitar Popov has presented five publications based on research from the dissertation, in all of them he is the first author and are co-authored by the project supervisors. These publications were published in peer-review scientific journals and contribute a total of 92 points (30 points required) according to the minimum national requirements under indicator group "D", which is three times over the requirements.

The personal contribution of the PhD student to the implementation of each stage of the dissertation work is evident. The achieved results and formulated contributions are a personal merit of Dimitar Popov.

7. Abstract of the PhD thesis

The abstract of PhD thesis is in accordance with the Regulations for the Development of the Academic Staff of the University of Plovdiv, accurately presents all sections of the dissertation work and reflects the results and original scientific and applied-scientific contributions achieved in the dissertation.

8. Personal impressions

I have known Dimitar Popov from various environmental protection activities and events in the Green Balkans organization and later as a PhD student at the Department of Zoology. My personal impressions of the PhD candidate, which I have built during this period, are excellent. Dimitar Popov is responsible, organised and dedicated and very competent in his work, hardworking as a researcher and responsive as a person.

I believe that these qualities have been formed in his long-term work in a team as an environmentalist and they will ensure his future professional development for the benefit of the Bulgarian nature.

CONCLUSION

Everything presented above undoubtedly shows that in the process of developing his dissertation, Dimitar Popov acquired in-depth theoretical knowledge and practical skills for work in the field of marine mammals.

He demonstrates abilities for independently conducting scientific research, analysing and summarising results, and drawing reasonable conclusions.

The dissertation contains scientific and applied-scientific results and has the characteristics of valuable research with potential for future development. The submitted dissertation, abstract, publications and set of accompanying administrative documents meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its implementation and the relevant Regulations of the University of Plovdiv "Paisii Hilendarski" for the acquisition of the educational and scientific degree "Doctor of Philosophy".

I confidently give my **positive assessment** of the conducted research, the achieved results and contributions, and **I propose to the respected scientific jury to award the educational and scientific degree "doctor" to Dimitar Vasilev Popov** in the field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences, Doctoral Program Zoology.

10.09 2023 г.

Statement prepared by:

(Assoc. Prof. Anelia Stojanova, PhD)