

## **EXPERT OPINION**

**by Mihaela Nikolova Nedyalkova, associate professor, PhD, IBER - BAS**

of a dissertation for awarding the educational and scientific degree "doctor"

by: field of higher education. 4. Natural sciences, mathematics and informatics professional direction 4.3. Biological Sciences.

doctoral program "Zoology"

**Author:** Dimitar Vasilev Popov

**Topic:** NUMBER AND DISTRIBUTION OF CETACEAE IN THE BULGARIAN TERRITORIAL WATERS OF THE BLACK SEA.

**Research supervisors:** Assoc. prof. Dr. Hristo Dimitrov

Assoc. prof. Dr. Marina Panayotova, IO-BAS.

### **1. General presentation of the procedure and the PhD candidate**

By order No. P33-211554 of 21.07.2023 of the Rector of the Plovdiv University "Paisiy Hilendarski" (PU), I have been appointed as a member of the scientific jury to ensure a procedure for the defense of a dissertation work on the topic "NUMBER AND DISTRIBUTION OF CETACEAE IN THE BULGARIAN TERRITORIAL WATERS OF THE BLACK SEA" for the acquisition of the educational and scientific degree "doctor" in the field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences, doctoral program "Zoology". The author of the dissertation is Dimitar Vasilev Popov. - full-time PhD student at the Department of Zoology with scientific supervisors assoc. prof. Dr. Hristo Dimitrov from PU "Paisiy Hilendarski" and assoc. prof. Dr. Marina Panayotova from IO-BAS.

The set of paper materials submitted by the PhD student Dimitar Vasilev Popov is in accordance with Article 36 (1) of the Regulations for the Development of the Academic Staff of the PU, includes the following documents:

- a request to the Rector of the PU to disclose the procedure for the defense of a dissertation work;
- curriculum vitae in European format;
- minutes from the department council related to reporting the readiness to open the procedure and preliminary discussion of the dissertation work;
- dissertation work;

- abstract;
- a list of scientific publications on the subject of the dissertation;
- copies of scientific publications;
- list of noticed citations;
- declaration of originality and authenticity of the attached documents;
- certificate of compliance with the specific requirements of the relevant faculty (only for doctoral students enrolled until 05/04/2018);

The PhD student has attached 5 publications

## **2. Relevance of the topic**

This dissertation presents detailed and comprehensive information regarding the number and distribution of the three species of cetacean mammals in the Bulgarian territorial waters of the Black Sea. The drastic reduction of the species as a result of industrial hunting until the early 1980s, their status as endangered species, as well as the important role of cetaceans in the Black Sea ecosystem have become problematic issues that make the topic of this dissertation extremely important, current and timely. In addition, the author also takes a step towards proposing measures for their conservation.

## **3. Knowing the problem**

The author makes a detailed and critical analysis of all available information on the three species of cetaceans in the Black Sea, providing data on their numbers and distribution in the Mediterranean Sea and the Atlantic Ocean. He manages to skillfully use this data in the comparative analysis of his own results. As a consequence of all this, the dissertation work has a clearly defined goal and tasks to be performed.

## **4. Research methodology**

To determine the density and number of cetacean populations, three types of modern, mutually complementary methods, fully adequate for the purposes of the study, were used. Appropriate statistical analyzes were used for data processing and reliability of the obtained results.

## 5. Characterization and evaluation of the dissertation and contributions

The dissertation is presented in the form of a book, on 335 pages, together with the appendices. It is structured in five main chapters, which are very well balanced according to their weight. A very good literary awareness has been demonstrated, on the basis of which there is also a clearly constructed hypothesis and well-formulated goals and objectives. Thanks to the complex of methods applied in the study, an impressive amount of data was collected for all three species of animals studied, which sheds additional light on the current state of cetacean populations in the Bulgarian Black Sea aquatory. The work is very thorough and precise, with serious scientific-theoretical and scientific-applied conclusions. The large amount of collected, analyzed and summarized information makes it possible to formulate and offer six recommendations to the competent authorities, related to the making of management decisions with conservation significance. Heavy and voluminous work was carried out over a long period of time, which is unique in its nature for similar type of studies in our country.

In my opinion, the work would benefit if its volume were shortened. 1. A detailed description of the biology and ecology of the three species of cetacean mammals is not necessary. This gives the work a slightly "textbook" character, and as some information it could be moved to the Literary Review. 2. Most of the information in description the results could also be reduced and only summary tables and graphs for each species could be presented. The large amount of monotonous and repetitive information for each type leads to slight confusion and loss of the "thread" when reading the dissertation. Bearing in mind, however, the fact that the Doctorate, in addition to being scientific, also has an educational character, this way of presenting the results demonstrates a very good knowledge of the subject matter and an excellent mastery of the methods, which is one of the goals of this educational degree. 3. The obtained results for the number and density of the populations are the main goal and the main result of the research, therefore I consider it appropriate to present them more clearly in the summary tables for the species. It would be good to move them to the top rows, where they will be easier to compare and more visible. 4. I believe that the concept of "number" should be clarified. In the way presented in this way, it is assumed that the absolute number of the population of a given species is in question. The transect method, by which the main part of the information was collected, suggests talking about relative numbers within the given "line" or transect.

The results of this large-scale research are collected and summarized in nine main conclusions, which practically summarize the main highlights and results of the dissertation. Conclusions 2, 3 and 4, regarding the population number of the three studied species, could be refined. Presented in this way, they rather have the character of findings.

Here is the place to note the special importance, relevance and significance of the obtained results, which gave the doctoral student the opportunity, confidence and courage to prepare and propose several extremely important recommendations from a conservation point of view to the competent

authorities involved in taking management decisions regarding the preservation of the sustainable status of the three species of cetacean mammals in the Black Sea.

The dissertation has an undoubted contribution to the development not only of Bulgarian marine zoology, but the results are important for the future development of this direction in the entire Black Sea region. Four scientific and three scientific-applied contributions are presented, which I consider important not only for the reasons listed above, but also as a solid foundation for the future career development of the doctoral student himself in this field.

## **6. Evaluation of the publications and personal contribution of the PhD student**

The PhD student has presented five scientific publications, all in refereed and indexed journals with IF, which not only covers, but also significantly exceeds the minimum requirements of the LDASRB and PU "P. Hilendarski". The leading role of the doctoral student in these studies is also obvious.

## **7. Abstract**

The content and quality of the abstract are as required and accurately and clearly reflect the main results achieved in the dissertation.

## **8. Recommendations for future use of dissertation contributions and results**

In conclusion, I would like to congratulate the PhD student for the enormous amount of work, the large amount of data that he managed to collect and process in this six-year period. Such work requires persistence, perseverance and a huge dose of scientific curiosity to bring the research to a successful conclusion. I would recommend that in the future he concentrates on a more concise and accurate presentation of the results of his studies and I wish that he finds a way and an appropriate methodology for reporting the sex and age structure of the populations of these three species. Data on seasonal and annual dynamics in the number of populations are essential for the creation of prognostic models for the development of the populations of these species.

## **CONCLUSION**

The dissertation contains scientific, scientific-applied and applied results, which represent an original contribution to science and meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of LDASRB and the relevant Regulations of PU "Paisiy Hilendarski" ".

The dissertation work shows that the doctoral student Dimitar Vasilev Popov possesses in-depth theoretical knowledge and professional skills in the scientific specialty "Zoology" by demonstrating qualities and skills for independent conduct of scientific research.

Due to the above, I confidently give my positive assessment of the conducted research, presented by the above-reviewed dissertation work, abstract, achieved results and contributions, and I propose to the honorable 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".

12. 09. 2023

Prepared the opinion: .....

(signature)

Assoc. prof. Dr. Michaela Nedyalkova