

## REVIEW

By DSc Dilyan Georgiev Georgiev, Associate Professor at the Faculty of Biology, Plovdiv University "Paisii Hilendarski"

On a dissertation for the award of the educational and scientific degree "Doctor"

in: Higher Education Area 4. Natural Sciences, Mathematics, and Informatics

Professional Field 4.3. Biological Sciences

Doctoral Program "Ecology and Ecosystem Conservation"

**Author:** *Alexander Emilov Petrov*

**Topic:** *"Comparative Study on Certain Aspects of the Ecology of the Red Fox (*Vulpes vulpes* L., 1758) and the Stone Marten (*Martes foina* Erxl., 1777) in Habitats of Different Types"*

**Scientific Supervisors:** *Assoc. Prof. Dr. Ivelin Aldinov Mollov, Plovdiv University "Paisii Hilendarski," Faculty of Biology, Department of Ecology and Environmental Protection; and Prof. Dr. Evgeni Georgiev Raychev, Trakia University, Faculty of Agriculture.*

### 1. General Description of the Submitted Materials

By Order No. RD-21-2268 of December 10, 2024, issued by the Rector of Plovdiv University "Paisii Hilendarski" (PU), I have been appointed as a member of the academic jury to oversee the procedure for the defense of the dissertation titled *"Comparative Study on Certain Aspects of the Ecology of the Red Fox (*Vulpes vulpes* L., 1758) and the Stone Marten (*Martes foina* Erxl., 1777) in Habitats of Different Types,"* for the award of the educational and scientific degree "Doctor" in Higher Education Area 4. Natural Sciences, Mathematics, and Informatics, Professional Field 4.3. Biological Sciences, Doctoral Program "Ecology and Ecosystem Conservation." The author of the dissertation is Alexander Emilov Petrov, a full-time PhD student in the Department of Ecology and Environmental Protection, with scientific supervisors Assoc. Prof. Dr. Ivelin Aldinov Mollov, Plovdiv University "Paisii Hilendarski," Faculty of Biology, Department of Ecology and Environmental Protection, and Prof. Dr. Evgeni Georgiev Raychev, Trakia University, Faculty of Agriculture.

The set of materials submitted by the doctoral candidate in paper format complies with Article 36(1) of the Regulations for the Development of the Academic Staff at PU and includes the following documents:

- A request to the Rector of PU for the initiation of the procedure for defending the dissertation;
- A curriculum vitae in European format;
- A protocol from the department council concerning the report on the readiness to initiate the procedure and the preliminary discussion of the dissertation;
- The dissertation;
- A summary of the dissertation;
- A list of scientific publications related to the dissertation topic;
- Copies of the scientific publications;
- A list of observed citations;
- A declaration of originality and authenticity of the submitted documents.

The doctoral candidate has submitted five publications related to their dissertation.

All of the scientific articles have been published in journals with a Q4 ranking, which exceeds the minimum required by law by twice the amount (5 publications × 12 points = 60 points).

## **2. Brief Biographical Information about the Doctoral Candidate**

Alexander Petrov was born on November 7, 1990. He has worked as a radio host and is developing a YouTube channel focused on environmental protection. In 2020, he graduated with a master's degree in "Biodiversity, Ecology, and Conservation" from the Faculty of Biology at Plovdiv University "Paisii Hilendarski." He has worked on numerous ecological projects and at the insectarium of the Regional Natural History Museum in Plovdiv. Since March 1, 2021, he has been enrolled as a full-time doctoral student in the Department of Ecology and Environmental Protection at the Faculty of Biology, Plovdiv University "Paisii Hilendarski." He is currently working at the environmental organization "More Wild Rhodope."

## **3. Relevance of the Topic and Appropriateness of the Set Goals and Objectives**

The relevance of the topic addressed in Alexander Petrov's doctoral dissertation is indisputable, as it encompasses the study of the feeding ecology and daily activity of two species of predators that are significant for both humans and nature – the red fox (*Vulpes vulpes*) and the stone marten (*Martes foina*). These species play a key role in the ecosystems of Bulgaria and Europe, making their in-depth study from both a scientific and applied perspective not only appropriate but necessary. Research on the feeding ecology and activity of predators is important not only for expanding knowledge about their biology but also for effective natural resource management and biodiversity conservation. In the context of increasing pressure on habitats in Europe, as well as the need for modern approaches to wildlife management, studies in this direction are extremely timely.

The dissertation demonstrates a clear and logical connection between the set goals and tasks. The main goal – to analyze the dietary spectrum and daily activity of the red fox and the stone marten in different ecosystems and seasons – reflects current trends in predator research. The tasks are clearly defined and aimed at revealing the ecological interactions of these species, as well as expanding existing knowledge of their biology in Bulgaria and Europe. The relevance of the

addressed issue is also evident in the scope of the tasks. These include studies on specific aspects such as seasonal changes in the dietary spectrum and activity, contributing to a deeper understanding of the adaptive strategies of both species in different ecosystems.

In conclusion, the topic of the dissertation is relevant and significant both scientifically and practically. The set goals and tasks are appropriate and adequately reflect the needs of contemporary ecological research.

#### **4. Knowledge on the Topic**

Alexander Petrov demonstrates a profound understanding of the problem, supported by a comprehensive literature review covering the feeding ecology and activity of the red fox and the stone marten in different ecosystems. Particularly valuable is the critical analysis of the literature, which combines an evaluation of contributions and the identification of gaps in existing research. The doctoral candidate emphasizes the importance of the national context by comparing data from Bulgaria with those from other regions of Europe. This approach not only enriches the analysis but also reinforces the significance of the results of the work.

#### **5. Research Methodology**

The research methodology chosen in Alexander Petrov's dissertation is clearly formulated and carefully aligned with the set goals and tasks. The analysis of the feeding spectrum and daily activity of the red fox and the stone marten covers a range of approaches that are appropriate for studying the biology and ecological interactions of these species. Research on the ecological niche and daily activity is supported by suitable field and laboratory analyses, consistent with established practices in ecology.

The methods are correctly selected, ensuring the acquisition of qualitative and quantitative data necessary to address the tasks in the dissertation. It can be concluded that the methodology is well-structured and fully appropriate for achieving the set goal.

#### **6. Characteristics and Evaluation of the Dissertation**

The dissertation of Alexander Petrov is characterized by a clear structure and well-argued connections between the various sections, which support the achievement of the research goals. Each section contributes to the development of the overall logic of the work, with the information presented in a coherent and justified manner.

The literature review provides a broad analysis of the existing research on the red fox and the stone marten, with the author demonstrating a critical attitude and the ability to summarize. The topics discussed are appropriately selected and position the research within the context of contemporary ecological studies.

The methodology is chosen in accordance with the goals and tasks of the work, and the collected data is presented in detail and with the necessary justification. The methods used are standard for the field and ensure the reliability of the results.

The results are analyzed analytically, with the author combining interpretation with appropriate statistical analyses. The discussion is in-depth and places the obtained data within a broader scientific context. An important aspect is that the doctoral candidate has taken into account the feedback and recommendations from colleagues during the internal defense, which contributed to the revision and improvement of the work. The dissertation provides well-argued conclusions, with contributions based on reliable data that have been carefully collected and processed. This makes it significant for expanding knowledge about the ecology of the studied species.

## **7. Contributions and Significance of the Work for Science and Practice**

Alexander Petrov's dissertation provides new data on the feeding ecology and daily activity of the red fox and the stone marten in different ecosystems. The main achievements consist of an in-depth study of these species both in Bulgaria and other parts of Europe, adding new information to existing research.

The author explores new questions regarding the ecological interactions of the two species, providing data on their feeding habits and activity in different seasonal and geographical conditions. This contributes to expanding the understanding of the adaptive strategies of predators and the dynamics of the ecosystems they inhabit. One of the major scientific contributions is the enrichment of methods for studying the ecological niches and activity of predators, which could be beneficial for future research in this field.

The practical significance of the work is linked to its potential application in the proper management of the environment and protected areas. The data could be useful for optimizing conservation strategies and managing the habitats of these species, taking into account the seasonal and spatial characteristics of their activity. Opportunities for further development of the research include expanding the analysis to other predator species and applying the methods in different geographical and ecological conditions, which could be valuable for future studies in this field.

## **8. Evaluation of the Publications Related to the Dissertation**

Five scientific publications are presented: three in *Ecologia Balkanica* and two in *ZooNotes*. Both journals are published by the Faculty of Biology at Plovdiv University "Paisii Hilendarski." I am the editor-in-chief of both journals. I have edited and reviewed parts or the entire publications of the doctoral candidate. I am familiar with the processes of preparing and publishing his works.

All of the scientific articles have been published in journals with a Q4 rating, which exceeds the legal minimum of 30 points (with  $5 \times 12 = 60$  points).

## **9. Personal Involvement of the Doctoral Candidate**

The assessment of the doctoral candidate's personal involvement in the conducted dissertation research shows that he was actively engaged in all stages of the work, including data collection, processing, and analysis, as well as formulating the conclusions and findings. The author of the thesis conducted necessary research in various geographical and ecological conditions, using established methods and approaches for gathering information.

Although he worked as part of a team, the doctoral candidate's contributions are clearly defined and demonstrate a profound understanding of the topic, as well as the ability to apply scientific methods. The results of the research are his personal achievements and reflect originality and independence in the research process. The formulation of new hypotheses and the interpretation of the obtained data are also his contributions.

## **10. Abstract**

The abstract has been prepared in accordance with the regulations and adequately reflects the main results and achievements of the dissertation. It contains a brief yet clear summary of the main objectives, methods, and results, allowing the reader to familiarize themselves with the key accomplishments of the research. The author has followed the necessary structure, including all essential aspects of the work, including contributions to the scientific field.

### **11. Critical Remarks and Recommendations**

I have no critical remarks regarding the doctoral candidate.

### **12. Personal Impressions**

I have edited and reviewed parts or entire publications of the doctoral candidate and am familiar with the processes of preparing and publishing his works. We have worked together as colleagues at the Regional Natural History Museum – Plovdiv. My personal impression of him is positive.

### **13. Recommendations for Future Use of the Dissertation's Contributions and Results**

I recommend that the doctoral candidate explore the possibility of further research that includes a broader range of predator species and different ecosystems to expand the scope of the obtained results and investigate other ecological patterns. Additionally, the use of new technologies for monitoring and analyzing the species' activity and feeding habits could contribute to a deeper understanding of their adaptability to changing conditions.

## **CONCLUSION**

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

The dissertation shows that the doctoral candidate, Alexandar Emilov Petrov, possesses in-depth theoretical knowledge and professional skills in the scientific specialty "Ecology and Ecosystem Conservation," demonstrating qualities and skills for conducting independent scientific research.

For the above reasons, I confidently give my positive evaluation of the conducted research, presented in the reviewed dissertation, abstract, results, and contributions, and I propose to the respected scientific jury to award the educational and scientific degree of "Doctor" to Alexandar Emilov Petrov in the field of higher education: 4. Natural Sciences, Mathematics, and Informatics, professional field 4.3. Biological Sciences, Doctoral Program "Ecology and Ecosystem Conservation."

31.12.2024 г.

Reviewer: .....

Assoc. Prof. DSc Dilian Georgiev