

REVIEW

by competition for the occupation of the academic position of "Docent" in professional direction 4.3. Biological sciences, scientific specialty "Ecology and ecosystem protection", announced in issue No. 92 of the State Gazette of 3.11.2023, with a single candidate Dr Teodora Marius Teofilova, Department of the "Biodiversity and Ecology of Invertebrates", section of the "Animal Diversity and Resources" at IBER - BAS

Reviewer: Prof. Dr. Vasil Valkov Popov, IBEL-BAN

The submitted materials for the competition include all the necessary documents and meet the requirements of the ŽRASRB, the Regulations for its implementation and the Regulations for the terms and conditions for acquiring scientific degrees and occupying academic positions at IBER - BAS.

BIOGRAPHICAL DATA

In 2001, Dr. Teofilova obtained a bachelor's degree in "Ecology and Environmental Protection" at the Forestry University, Sofia, and in 2006, at the same university, a master's degree in "Rural Ecology". In 2014, she defended her thesis at the Faculty of Biology of Sofia University "St. Kliment Ohridski", Sofia and obtained a Doctorate degree in "Ecology and Ecosystem Protection". The topic of the dissertation is "Composition and structure of carabid communities (Coleoptera: Carabidae) in different types of ecosystems in the Cape Emine area". From 2015 until now, she has been working at IBER - BAS as an ecologist/entomologist.

DESCRIPTION OF MATERIALS SUBMITTED

To participate in the competition, the candidate submitted 25 scientific publications (besides those related to the dissertation, 4 publications that are not reviewed, but are taken into account in the general evaluation of the candidate's scientific activity), 13 of which are in journals with IF, and the rest in SJR-ranked journals only. The papers are independent and there is no overlap between them. All articles are in English, and in 10 of them Dr. T. Teofilova is the sole author, in 6 - first author, in 6 - second author, and in 3 - third and subsequent author. The presented articles are arranged according to groups of indicators, adopted by the Decision of the OS of BAS dated 22.10.2018, with amendments from 18.03.2019 and 20.05.2019. Group B4 "Habilitation Work" includes 7 articles, published in the journals Diversity (Q1), North-Western Journal of Zoology (Q2), and Acta Zoologica Bulgarica (Q3), which carry 105 points (minimum 100). The remaining 18 publications are assigned to group G7 indicators, and they carry 232 scores (minimum 220 scores). This group also has articles published in prestigious publications such as ZooKeys and Archives of Biological Sciences. The distribution of all articles by quartiles is as follows: Q1 (2 items), Q2 (1 item), Q3 (10 items) and Q4 (12 items). The candidate's overall impact factor is 9.87. In terms of number and quality, the works presented exceed the minimum national requirements and the minimum requirements of the BAS for occupying the academic position "Docent", as well as Art. 5 of the Regulations on the terms and conditions for acquiring scientific degrees and for holding academic positions at IBER-BAS (Amended 25.11.2022). The current reference in the databases with scientific information (Web of Science and Scopus) shows that the h-index, which evaluates the productivity and significance of Dr. T. Teofilova's publications, is 5.

Along with the competition documents, the candidate also submitted a reference for 80 of her reports and posters in 42 international scientific forums, of which 10 were at forums held abroad. The subject is too broad - entomology, arachnology, ichthyology, herpetology, mammalogy, hydrobiology, conservation ecology. The presentation of the results of Dr. Teofilova's research at these forums undoubtedly contributed to her establishment in scientific circles and to the creation of personal contacts with leading specialists in these fields.

MAIN DIRECTIONS AND CONTRIBUTIONS

The research activity of Dr. T. Teofilova is in the field of zoology and conservation ecology with emphasis on taxonomy, faunistics, zoogeography, ecology and ecological regularities in the spatial distribution of species and communities of ground beetles (Coleoptera: Carabidae) and biology and ecology of species of conservation importance. The most important contributions of the candidate can be summarized as follows:

Faunistic contributions:

- Two species of ground beetles new to the fauna of Romania
- Six new species of beetles from the family Carabidae, Dytiscidae, and Chrysomelidae for the fauna of Bulgaria
- One genus and two species from the family Chironomidae (Diptera) new to Bulgaria
- Regional new data for species from the Carabidae family: 10 species for the territory of the "Srebarna" reserve; 46 species for the Tundzhan-Sakar region, 11 genera, 2 subgenera and 60 species for the Eastern Rhodopes; 25 species for the entire territory of the Rhodopes (Western and Eastern); 6 species for the entire Danube plain and 120 – for its western part; 2 species for the Bulgarian Struma Valley; 13 species for Pirin
- Two species of water beetles have been registered for the first time in Stara planina
- 14 species of syrphid flies (Diptera: Syrphidae) are reported for the first time for the Karlovo basin
- All species of small mammals (except synanthropic mice and rats) found in owl pellets are new to the area of Silistra
 - For *Leistus piceus* (Carabidae), the first reliable and specific data and locality in Bulgaria are given

- Five species of ground beetles are reported for the second time from the country, with secure localities
- Confirmatory data are presented for four species of carabids that are not included as occurring in Romania either in the Palearctic Catalog of Coleoptera or in popular Internet sources and databases, but for which there is single literature information.

Ecological contributions:

- The bioindicator role of beetles in tracking global climate change and anthropogenic pressure has been confirmed
- The determining importance of humidity and soil conditions for the spatial distribution of ground beetles has been confirmed
- The possible role of altitudinal gradient, substrate type and vegetation in the distribution of ground beetles has been confirmed
- A positive correlation was found between the abundance and species richness of ground beetles and the minimum temperatures at night
- The spectra of the life forms in the ensembles of the ground beetles from different regions of the country have been determined
- The ecological structure of the ground beetles from different regions was analyzed in terms of the development of their flight wings and the regularity of the predominance of winged forms in the conditions of greater intensification of agriculture and other anthropogenic impacts was confirmed
- The ecological structure of the communities of ground beetles from different regions in our country has been established in terms of their preferences for humidity
- The five main subtypes of ecosystems with rare vegetation in our country were studied and, based on an analysis of the species composition of the ground beetles, they were divided into two groups - coastal and inland

- A zoogeographical classification of the ground beetles in Bulgaria was developed and the zoogeographical structure of their ensembles from different regions of the country was established
- Different aspects of the ecological structure (dominance and trophic structure, biodiversity indices, density) of syrphid fly complexes in different types of agroecosystems and under the influence of different pesticides have been established

Contributions to conservation biology:

- The knowledge about the invertebrate fauna (mainly for the ground beetles) in several protected areas with an emphasis on species of conservation and scientific importance - protected, rare, endemic or of limited distribution - has been collected or supplemented; the negatively acting factors of natural or anthropogenic origin are characterized and specific measures are proposed to eliminate the impact of these factors and to optimize the ecological situation; on the basis of the collected data, it contributed to the preparation of Management Plans for some of the studied reserves ("Leshnitsa", "Dolna Topchiya" and "Balabana")
- The knowledge about the biology, ecology, distribution and status of a number of species of conservation importance (protected, rare, endemic or with limited distribution, some indicators) has been supplemented and analyzed - ground beetles, water beetles, the saproxylic beetle *Cerophytum elateroides*, fish, birds (eared owl) and mammals (otter)
- Zoocenoses have been analyzed in specific and conservationally significant and poorly studied habitats, which contributes to taking adequate measures for their protection
- On the basis of the analyzed information, it is planned to take immediate measures to include the Bessarabian ground beetle (*Carabus bessarabicus*) in the national and European nature protection documents, as well as to initiate a procedure to declare Chepan Mountain as a Protected Territory
- Contribution to hydrobiological monitoring is the mapping and passporting of the ichthyofauna as a component in the otter diet and the assessment of the importance of the predator for the hydrobionts, as well as the study of eight dams in Bulgaria (Ecoregion 7 and

Ecoregion 12), in which the parameters were measured and calculated of the water and some alien and potentially invasive species of macroinvertebrates have been found

Methodological contributions:

- It has been demonstrated and confirmed that light trapping can be a valuable and easy method to study ground beetles, especially in wetlands, as a supplement to the standard soil trap method or when studying species with specific biology and ecology
- A model of the distribution of ground species by subtypes of grass ecosystems, altitude and regions in Bulgaria was prepared and a 5-point system was developed for evaluating the species richness of grounds and the condition in the five subtypes of grass ecosystems

I accept the "Reference of Scientific Contributions" submitted by the candidate, which contains the most essential results and conclusions of Dr. T. Teofilova's scientific research and accurately reflects her scientific and scientific-applied contributions.

SIGNIFICANCE OF THE RESULTS OBTAINED

Recognition of the significance of the candidate's scientific contributions is the fact that many of the scientific articles have received international recognition - 18 of them have been cited 34 times. According to the report presented, 68 scores were collected under this indicator (D). The citations presented in the report exceed the required minimum (20 citations, of which at least 10 are in specialized international publications with an impact factor; 60 points for indicators from group "D").

MANAGEMENT AND PARTICIPATION IN PROJECTS

In the competition materials, a reference is presented on the participation of Dr. T. Teofilova in 28 national and international projects and expertises, which have both a scientific and a scientific-applied nature.

ASSESSMENT OF PERSONAL CONTRIBUTION AND WORK PROFILE

As can be seen from the submitted reference for participation in projects and expertise, as well as the author teams of the publications submitted for the competition, the wide range of scientific issues developed with the participation of Dr. T. Teofilova in many cases necessitates her participation in numerous scientific teams and is an indication of her aptitude for teamwork. Her involvement as a participant in numerous national and international projects is proof that she is accepted as a respected partner, due to her expertise and methodical experience. The large number of publications in which she is the sole or first author, on the other hand, speaks of a clearly defined scientific profile and an opportunity to conduct independent scientific research and lead scientific projects. All this gives me reason to believe that she is an active and promising researcher with undoubted scientific qualifications who knows and applies a number of modern research methods in the direction of the announced competition "Ecology and Ecosystem Protection".

EDUCATIONAL AND PEDAGOGICAL ACTIVITY

Dr. T. Teofilova has teaching experience gained while leading exercises in "Ecology and Environmental Protection" for full-time students, majors "Molecular Biology", "Biology and Chemistry", "Geography and Biology" and "Biotechnologies" at the Faculty of Science of the SU " St. Kliment Ohridski". She was the scientific consultant of a bachelor's thesis and the supervisor of a master's thesis on the topic "Conservation significance of the Western Rhodope Mountains and the adjacent protected territories and zones with regard to the beetle fauna (Coleoptera: Carabidae)".

Critical notes

Article [8] "Ground beetles (Coleoptera: Carabidae) in grasslands: Model for assessment ..." represents a synthesis and analysis of the existing information on the distribution of Carabidae species by grass ecosystem types and altitude zones. The obtained results provide valuable generalizations, but their credibility remains conditional, due to lack of information about the source information. As a result, the objectivity of the proposed distribution of species by grass ecosystem types and altitudes cannot be assessed. Furthermore, the proposed 5-point rating

scale is based on "common species", but since this is a subjective category, the practical application of this scale is problematic. These species should be listed or marked in Appendix 1.

According to the data in GBIF (https://www.gbif.org/occurrence/search?offset=120&taxon_key=4471067) the nearest occurrence of *Carabus bessarabicus* is approx. 800 km, and not more than 1200 km, as claimed in article [11].

On p. 8, second paragraph, in the same article, the places of "eastern" and "west" are interchanged. The quoted source says "... during the Holocene, some of the steppe species characteristic of the Pleistocene moved eastward," i.e., the western limit of the ranges moved eastward, not the eastern one westward, as written in the article [11].

CONCLUSION

Based on the review of the presented scientific works, a list of citations, participation in scientific forums, project and teaching activities, I express my firm opinion that Dr T. Teofilova is a scientist with a clearly defined profile and significant achievements in the field of zoology and conservation ecology and meets the requirements for the academic position of "Docent" in the specialty "Ecology and Ecosystem Conservation". I propose to the Honorable Jury to formulate a proposal ch. assistant professor Dr. Teodora Marius Teofilova, to be elected to the academic position "Docent" by the National Assembly of IBER-BAS.

26 February 2024

Reviewer: Prof. Dr. Vasil Popov

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