REVIEW

by

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regarding the competition for academic position **"Professor"** in professional direction 4.3. Biological Sciences (Vertebrate Zoology, Geographical Information Systems), for the needs of the Faculty of Biology of Sofia University

I. General part

The competition for "professor" by professional field 4.3. Biological Sciences (Vertebrate Zoology, Geographical Information Systems) was announced in the Official Gazette, no. 100 from 16.12.2022. The only candidate for participation in the competition is Assoc. Prof. Dr. Diana Peneva Zlatanova from the Faculty of Biology of Sofia University.

The review of the submitted documents shows that the procedure for disclosure and announcement of the competition has been followed and they have been prepared in accordance with the ZRASRB, the Rules for its application and the internal rules of the SU. Assoc. Prof. Zlatanova submitted the documents required by law, including: (i) the competition announcement in the State Gazette; (ii) curriculum vitae; (iii) diplomas for the acquisition of the scientific-educational degree of doctor and the scientific title of Associate Professor; (iv) reference to scientific contributions; (v) lists of scientific works, citations, participation in scientific events; (vi) copies of scientific papers and other materials.

II. Brief details of the applicant

In 1991, Diana Zlatanova graduated from the Faculty of Biology of the SU with a qualification in Biology and a specialization in Ecology. In the period 1993-2011, she worked in the Zoological Garden - Sofia, passing through various positions. In 1996, Zlatanova specialized in Great Britain, where she studied Methods and Management for "Reproduction and Conservation of Endangered Species" and practiced at the Jersey Zoo. As part of her scientific educational development, she also defended her thesis at the University of Kent, Great Britain.

In a later period, from 2006 to 2009, Zlatanova continued her studies as a doctoral student in the Department of Zoology and Anthropology of the Faculty of Biology of the SU under the supervision of Assoc. Prof. Danielo Peshev. The topic with which she defends her PhD degree is "Modeling the suitability of bear habitats (*Ursus arctos*), wolf (*Canis lupus*) and lynx (*Lynx lynx*) in Bulgaria". Subsequently, in the same department, she continued her career development, further developing the thematic focus of her research and teaching work in the field of Vertebrate Zoology. The certificate issued by the "Human Resources" department of the Sofia University shows that in the BF she holds the following positions: "principal assistant" as of 01.09.2011 and from 07.11.2016 until now "Associate Professor". The review of the candidate's career growth and professional qualifications show that her research and teaching activities correspond to the subject matter of the announced competition for "Professor" in the Department of "Zoology and Anthropology" of the Biology Faculty.

III. Scientometric analysis of the presented materials

Until the moment of inclusion in the competition, the scientific activity presented by Dr. Zlatanova was mainly realized through her participation in articles in scientific journals – 39, scientifically popular articles – 2, articles in series - 7, articles in proceedings – 16. She has been involved in 30 projects and has been the supervisor of a significant number of graduate students and two PhD students. Dr. Zlatanova takes part in a number of national and international conferences. She also participates in editorial activity.

Dr. Zlatanova realizes a high teaching activity in the Department of Zoology and Anthropology of the Biology Faculty of the Sofia University, carried out through the preparation of study courses and leading lectures, exercises and seminars.

IV. Compliance with the requirements for holding the academic position "Professor"

From the report presented by Dr. Zlatanova about her research and teaching activities, it is established that the candidate meets the minimum national requirements under Art. 2b of the RASRB for the scientific field "Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences" (Vertebrate Zoology), to hold the academic position of "Professor".

The performance of the indicators by points is presented in the table below.

General scientometric evaluation of the activity of Assoc. Prof. Zlatanova in relation to the minimum mandatory conditions and quantitative criteria for participation in a competition for "Professor"

Group	Indicators	Points realized	Requires points
A	1. Dissertation labor for awarding on educational and scientific degree *doctor*	50	**50**
B	3. Habilitation labor - scientific publications in editions, who are referenced and indexed in Web of Science and Scopus	126	**100**
G	7. Scientific publication in editions, who are referenced and indexed in Web of Science and Scopus, outside habilitation- the Zionist labor	284 claimed reduced 209	**200**
D	11. Quoted in scientific editions, monographs, collective volumes and patents, referenced and indexed in Web of Science and Scopus	3.512	**100**
E	13. Guidance on successfully protected PhD students 14. Participation in national scientific or educational projects 15. Participation in international scientific or educational projects 16. Guidance on national scientific or educational projects Total points	100 100 40 140 380	**150**

It precisely reflects all the scientific communications stated by the candidate and the various aspects of her managerial activity, as well as the points awarded to them, according to the characteristics with which Dr. Zlatanova graded them.

The detailed verification of the information reflected in each group of indicators, regarding the status of the presented works, in accordance with the conditions for participation in the competition, states that the inclusion in "Group of indicators D" of (D5) or " *Action plan for the protection of the Balkan chamois …"* as **"Published monograph not presented as a major thesis"** and the judgment that messages (*G8-1, G8-2 and G8-4*) included in "Group of indicators G8" such as **"Published book chapter or collective monograph"** are three book chapters reveals that these publications do not meet the requirements to be included in the relevant groups of

indicators, and it is necessary to reduce the total score. After the total reduction of this indicator from the initially requested 284 points, 209 points remain. The remaining points requested by the candidate were recognized and despite the removal of points from “Indicator G”, the formal comparative analysis showed that in each group of indicators the candidate presented with more of the required, relative to the minimum required points.

To participate in the competition, Assoc. Prof. Zlatanova submitted 25 scientific reports. The detailed review of the summarized results reflected in the “Habilitation thesis” and “Author's reference” outline the profile of scientific research activity of Dr. Zlatanova with a clearly marked emphasis on the use of remote observations and the application of information technologies (Geographical Information Systems and other) to study the fauna. The use of these technologies gives her the opportunity, carrying out her scientific research activity, to achieve a variety of original results. They are current, important and of interest, both from a fundamental and from a scientific-applied point of view. In the analysis of the scientific communications submitted for participation in the competition, the numbers of the publications with which they are reflected in the materials submitted for participation in the competition are marked in brackets.

Based on the results of 8 articles, the Habilitation Thesis (Indicator B) was formed. The results of the scientific research are published in scientific journals, referenced and indexed in world databases with scientific information (WoS or Scopus) in the field of the competition. Three articles were published in journals with quartile Q2, 2 articles with Q3 and 3 articles with Q4. In total, the points achieved in this section exceed the minimum requirements.

The scientific results presented by Assoc. Prof. Zlatanova, included in the Habilitation Thesis, form three thematic areas. In this review, I will sequentially and briefly consider the main contributions in each of them, marking in which scientific communications they are presented.

V. Analysis of the scientifically fundamental and scientifically applied value of the results included in the “Habilitation Thesis”.

A. Scientifically fundamental contributions in scientific works on Indicators B

Studies on mammals included in the Habilitation Thesis (Indicator B) lead mainly to results of a fundamental scientific nature. The joint summary review of the presented scientific contributions in this indicator outlines the following directions of the candidate's activity:

Evaluation of the relationships of mammals with other species and in particular predation, competition or cooperation presented in publications B4-1, B4-4, B4-7 and B4-8.

When studying the wolf (*Canis lupus*) in the Osogovo Mountains, the selection of victims by a predator is being studied (B4-1). In this investigation, a complex research approach is applied, which allows to determine the real choice of victims. The obtained results show that the wolf in the Osogovo Mountains does not choose the most abundant prey in terms of number, but the one that will be the most energetically efficient per unit of hunting effort.

Through the use of photo traps, a male wolf was registered, which accompanied a pack of feral dogs in the border areas of the Osogovo Mountains (B4-4). This is an interesting finding due to the fact that all cases so far in which non-agonistic behaviour between a female wolf and a dog has been observed which has lost her partner. It is accepted that these are also the only cases when hybrids are created. It has been suggested that the likely reason for the male wolf joining the pack was an injury.

The presence and diversity of mammals at artificial feeding sites and how these species reduce their competition for food are analysed (B4-7). Again, with the help of photo traps, the visit of 14 species of mammals – 12 wild and 2 domestic species – to 62 game feeding sites placed in four hunting and 3 forest farms in the Western Rhodopes was established. It was found that the species that benefited most from feeding was the wild boar (*Sus scrofa*). This study shows the high tolerance of species visiting feeding sites at the same time, including those that are serious competitors for food.

The division of the trophic, spatial and temporal ecological niches of the sympatric species - *Vulpes vulpes*, *M. foina* and *M. martes* were studied. It was carried out in two mountains - Vitosha and Pirin, which are characterized by different food resources, leading to different numbers of the two species of the Martes genus - predominance of *M. foina* in Vitosha and *M. martes* in Pirin. On the basis of collected and analysed excrement and data from photo traps, seasonality in the overlapping of food niches and almost complete spatial coverage of the fox with the representatives of the Martes genus was established (B4-8).

In a group of three articles included in the Habilitation Thesis (B4-2, B4-3 and B4-5), the main results reflecting the scientific research activity of Dr. Zlatanova, which is related to the study of behavioural aspects of mammals, during assimilation, are presented and use of habitat resources and avoidance of threats.

Two of the publications (B4-2 and B4-3), using GSM/GPS telemetry and geographic information systems analyses reveal the behaviour of a brown bear (*Ursus arctos*) in the Central

Stara Planina region (B4-2) after capture and the size of the individual territory and resource utilization (B4-3).

In a publication (B4-5), again through data from GSM/GPS telemetry and analysis in Geographic Information Systems, the individual territory and mobility of red deer (*Cervus elaphus*) in four regions in Bulgaria - Central and Eastern Stara Planina, Ludogorie and Western Rhodopes.

The next direction in the research activity of Dr. Zlatanova is the analysis of the applicability of new approaches to the study of the diversity of species is protected by the evaluation reflected in the article (B4-6) of three different field designs of placing photo traps, in which the recommendations for conducting rapid environmental assessments.

VI. Analysis of the scientifically fundamental and scientifically applied value of the works included in the "Author's Reference"

The presented scientific reports on indicators G (18 papers) are with a diverse contribution nature. The papers with both fundamental and scientific-applied value are included here. In relation to the studied species, representatives of various are covered classes vertebrates animals.

A. Scientifically fundamental contributions in scientific works on Indicators G

As contributions of a fundamental character can be considered the results obtained in:

Carrying out an inventory of the vertebrate animals of Lyulin Mountain (G7-1); the assessment of the prerequisites for the availability of food resources (G7-2) in relation to the selection of nesting habitat for *Aquila chrysaetos*, *Buteo rufinus* and *Falco peregrinus* along Stara Planina; expanding knowledge about a poorly studied Balkan subspecies of the *Lacerta agilis bosnica* (G7-3); the comparative analysis of three field methods (G7-6) for monitoring mammals, with a target species of *Capreolus capreolus*; the comparison of the spatial distribution and numbers of vultures and wolves on the Iberian and Balkan peninsulas (G7-7); the analysis of data on use of feeding sites by marked *Eurasian griffon vulture* (G7-8); the use of radio implants and a description of a procedure for implanting radio transmitters and the features of radio telemetry on *Meles meles* (G7-11).

B. Scientific applied contributions in works contained in Indicators G

In the same Indicator "G" are also presented articles that reflect results with a scientific and applied approach value in the field of zoology:

Using the concept of naturalness, the current state of ungulate management in European national parks is assessed (G7-5). The objective of this study was to determine whether ungulate management strategies are consistent with the objectives set for protected areas; Assessment of the European wild cat *Felis silvestris* (G8-3) and the preparation of information on the characterization and according to the category and criteria of the Red List; The Ornithologically Important Site Bakarlakka, located on the southern Black Sea coast has been analysed (G8-5). It is providing a list of the population status of the most important bird species in the area, the vulnerability and threats at the site, and the appropriate conservation regimes and measures; An analysis was made of Ornithologically Important Site Osogovo (G8-6), which is located in South-western Bulgaria, and covers most of the mountain of the same name on the territory of Bulgaria. Mountain habitats have been shown to be vulnerable to human activities related to forestry, agriculture, water use and unsustainable use of natural resources.

VII. Reflection (citation) of the candidate's publications in the literature

The evaluation of Dr. Zlatanova's activity through the value of "Indicator D" compiled by reviewing the citation number from Scopus for the post-habilitation period (2017-2022), shows an impressive number of 1756 citations with a realized index H = 7. The following a detailed analysis of the composition of the aggregate number of citations of the 25 articles submitted for participation in the competition shows an uneven distribution in terms of the citation's number and the quantitative composition of the author teams.

VIII. Comprehensive qualitative assessment of teaching activity, including scientific guidance of students and promotion of scientific results

Assoc. Prof. Zlatanova's strong presence in the educational activities of the Department of Zoology and Anthropology has been protected through her leadership, leading to the successful leadership of two doctoral students and a significant number of graduate students. She actively works in projects of a scientific or educational nature, both at the national and international level, and in a number of cases she is their leader.

Popularization of the scientific results of Dr. Zlatanova, obtained after taking up the academic position of Associate Professor, has also been carried out through numerous participations in scientific forums.

IX. Conclusion

The comprehensive review of Dr. Zlatanova's overall activity demonstrates that she fulfils all the mandatory conditions and quantitative criteria and in many cases exceeds them. The subject of her scientific research (Vertebrate Zoology, Geographical Information Systems) is fully in line with the topic of the competition and of the Department of Zoology and Anthropology at the Biology Faculty, for whose purpose it was announced. The general observation of Assoc. Prof. Zlatanova's scientific production and teaching experience in the field of the competition show that they meet the requirements for holding the academic position of "Professor". This gives me the reason to give my **positive assessment** and recommend to the members of the esteemed Scientific Jury, as well as the Faculty Council of Biology Faculty and the Academic Council of Sofia University, to award Assoc. Prof. Dr. Diana Zlatanova the academic position of "Professor" in a professional direction 4.3. Biological Sciences (Vertebrate Zoology, Geographic Information Systems).

Sofia, April 14, 2023 Reviewer……

(Prof. DSc. Georgi Markov)