

## REVIEW

from Assoc. Prof. Dr. Tsenka Georgieva Chassovnikarova

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of the materials submitted to the competition for the academic position of "Professor"  
at Sofia University "St. Kliment Ohridski"

by field of higher education 4. Natural Sciences, Mathematics, and Informatics,

Professional field 4.3 Biological sciences

(Vertebrate Zoology, Geographic Information Systems)

In the competition for "professor", announced in the State Gazette, No. 100 of 16.12.2022 and on the website of the Sofia University „St. Kl. Ohridski” Dr. Diana Peneva Zlatanova from the Department of Zoology and Anthropology of the Faculty of Biology of Sofia University participated as the only candidate.

### **1. General presentation of the materials received**

#### ***Subject:***

By Order No. RD-38-66 of 01.02.2023 of the Rector of the University of St. Kl. Ohridski" I have been appointed as a member of the scientific jury of the competition for the academic position of "**professor**" at Sofia University "St. Kliment of Ohrid. Ohridski" in the field of higher education 4. Natural Sciences, Mathematics, and Informatics, professional field 4.3 Biological Sciences (Vertebrate Zoology, Geographic Information Systems).

#### ***Brief biographical details of the applicant***

Assoc. Prof. D. Zlatanova graduated from Sofia University "St. Kl. Ohridski" in 1991 with a Master's in biology, with a specialization in Ecology. Her entire professional career has been devoted to vertebrate zoology and in particular to mammalogy. She studies large and medium-sized mammals, and more recently large birds of prey and reptiles. She is interested in spatial analyses in GIS environments and modeling. These professional interests are realized as Head of the Cats Sector, Head of the Zoo collection, Head of the Carnivores Sector, and Head of the Science and Education Sector at the Sofia Zoo. In 2010 she obtained a scientific degree "Ph.D." at Sofia University, and since 2011 she has been holding the position of the Chief Assistant Professor at the Department of Zoology and Anthropology, Sofia University. In 2016 she received the scientific title of Associate Professor in

Vertebrate Zoology. The total work experience of the candidate in the specialty is 32 years and 10 months, of which 12 years Assoc. Prof. Zlatanova has been a lecturer at Sofia University.

*Characteristics of the overall scientific activity of Assoc. Prof. D. Zlatanova*

The presentation by Dr. D. Zlatanova's set of materials on electronic media, at <https://elearn.uni-sofia.bg/mod/assign/view.php?id=1117665> proves that the participant in the competition meets the conditions of Section IV of the law on the development of academic staff in the Republic of Bulgaria (LDASRB), respectively - Articles 60 and 61 of the LDASRB, and items 1 - 5 of Section V of the Recommendations of the Sofia University "St. Kl. Ohridski". The present review has been prepared in accordance with this normative basis. The reference for the minimum requirements under Art. 26 of the LDASRB for the scientific field 4.3. Biological Sciences (Vertebrate Zoology, Geographical Information Systems) are in accordance with the regulatory requirements. The entire large volume of documentation for the competition has been prepared in accordance with the requirements for the academic post of 'professor', arranged in a diligent and comprehensible manner, and designed with attention to detail and factual accuracy.

The candidate has submitted a total of 90 scientific papers and applied research, 2 teaching aids, and 2 popular scientific articles (according to the All-publications list -1): 37 scientific publications (31 refereed in Scopus and Web of Science), 22 scientific reports in proceedings of scientific conferences and 31 monographs, chapters of monographs, books, chapters of books and applied research. I do not think combining monographs, books, and applied research in one rubric is correct. From this list, only 10 titles can be assigned to the headings chapters of monographs or books. The remaining 21 are applied research because they do not meet the requirements of the LDASRB, Supplementary Provisions §10.1 - "A monograph is a scientific work that does not repeat or summarize existing knowledge, that has a scientific editor and/or scientific reviewers, has an ISBN, and is at least 100 standard pages with 1800 characters per page." The applicant has not submitted a list of scientific works from previous competitions - for the award of Ph.D., Assistant Professor, and Associate Professor - but has submitted a declaration that no scientific works from previous competitions have been used in the present competition.

The total impact factor of the candidate is **60.617**, and the distribution of scientific papers by quartiles is as follows: 5 papers in Q1, 4 in Q2, 8 in Q3, and 17 in Q4. One article was published in the Science journal (IF=33.611), 13 in Acta zoologica bulgarica, 5 in Biotechnology and Biotechnological Equipment, 3 in Nature Conservation Research, etc. According to her Scopus profile Assoc. Prof. Zlatanova has an h-index of **8** (<https://www.scopus.com/results/authorNamesList.uri?st1=Zlatanova&st2=Diana&origin=searchauthorlookup>).

The candidate's scientific output is the result of an impressive project, teaching and editorial activities, and active participation in scientific forums. The numerical expression of this activity is as follows: Dr. Zlatanova has been a leader or participant in 30 scientific research projects, has provided scientific supervision for 27 doctoral and diploma theses, has participated in 71 scientific conferences, is a member of the editorial board of one scientific journal (*Acta zoologica bulgarica*) and of 6 compendiums of scientific conference papers.

***Characteristics of the scientific activity of Assoc. Д. Zlatanova, presented in the competition for the academic position of "Professor"***

In the competition for "Professor", Dr. Zlatanova participated with a total of 19 articles, distributed by quartiles as follows: 2 papers in Q1, 3 – in Q2, 4- in Q3 и 10 – in Q4. The total impact factor for the competition period is **17.04**. In three of the submitted articles Assoc. Prof. Zlatanova is the first author (15%) and in 6 (31%)- the second, i.e., in almost half (47%) of the scientific papers she has a leading role as a researcher.

From the submitted works under the group of indicators G of the minimum national requirements under Article 2b of the LDASRB the works presented in the following headings should be abolished: **G5** (Published monograph not submitted as a major habilitation work- Zlatanova D. & Popova E. 2022. Action plan for the conservation of the Balkan wild goat (*Rupicapra rupicapra balcanica*, Bolkay, 1925) for the period 2022-2031 in Bulgaria, Ministry of Environment, Sofia. 198 p.) and 3 book chapters presented under the heading **G8 (D8-1)**. Dutsov A., Tsingarska E. & Zlatanova D. 2022. 1.2. Wolf feeding. Food spectrum of the species in our country: 1.2.2 First data on the food spectrum of the wolf in Pirin, Kraishte, and Osogovo. - In. Action plan for the European wolf (*Canis lupus lupus* L.) in Bulgaria 2022 - 2031: pp. 12-14. Sofia. MINISTRY OF AGRICULTURE. Approved by Order 00609/15.07.2022 of the Executive Director of the Executive Forestry Agency/Ministry of Agriculture, Food and Forestry; **G8-2**. Zlatanova D. 2022. 4. Limiting factors. Threats to the species: 4.1. Infrastructure as a source of barriers for the species. - In. Action plan for the European wolf (*Canis lupus lupus* L.) in Bulgaria 2022 - 2031: pp. 3-37. Sofia. MINISTRY OF AGRICULTURE. Approved by Order 00609/15.07.2022 of the Executive Director of the Executive Forest Agency/Ministry of Agriculture, Food, and Forestry; **G8-4**. Boitani L., Kaczensky P., Alvares F., Andr n H., Balys V., Blanco J.C., Chapron G., Chiriac S., Cirovic D., Drouet-Houguet N., Groff C., Huber D., Iliopoulos Y., Ionescu O., Kojola I., Krofel M., Kutal M., Linnell J., Majic A., Mannil P., Marucco F., Melovski D., Meng ll ođlu D., Mergeay J., Nowak, J. Ozolins, A. Perovic, G. Rauer, I. Reinhardt, R. Rigg, V. Salvatori, B. Sanaja, L. Schley, M. Shkvyria S., Sunde P., Tirronen K., Trajce A., Trbojevic I., Trouwborst A., von Arx M., Wolfl M., Zlatanova D. & Patk  L. 2022. Assessment

of the conservation status of the Wolf. Standing Committee on the Convention on the Conservation of European Wildlife and Natural Habitats. Strasbourg, 2 September 2022, T-PVS/Inf (2022)45, 25 p.). They do not meet the requirements for monographs and book chapters set out in the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), Additional Provisions § 1. 10, Regulations for the Implementation of the LDASRB, Notes: 5, Regulations on the Conditions and Procedure for the Acquisition of Scientific Degrees and the Occupation of Academic Positions at the Sofia University "St. Kl. Ohridski", Additional Provisions § 1. 7 и § 1. 11.

In the group of indicators D Assoc. Prof. Zlatanova presents 1756 citations for the period 2017-2022. Of these, 1012 are citations to the publication of Diaz et al. 2015, and 628 to the publication of Chapron et al. 2014. The list of citations was prepared very correctly. With this very large number of citations and authors in both publications (86 in the first paper and 76 in the second paper), I found only 8 autocitations for the first paper and 1 for the second paper. These two articles also account for 93% of all citations.

In the group of indicators E, the candidate participated in the competition with two PhDs, with participation in 10 national and 2 international research projects. Assoc. Prof. Zlatanova has also led 7 national research projects. The summary analysis of the metric indicators of Dr. Zlatanova's scientific papers, citations, and scientific activities submitted for the competition shows that she fully meets the required minimum national requirements under Article 2b of the LDASRB. She scored 126 out of the required 100 points for indicator V, 209 out of the required 200 points for indicator G, 3512 points for indicator D with a minimum of 100 points, and 380 points for indicator E with a minimum of 150 points.

All the above-mentioned metric indicators are evidence for two important conclusions: 1. The candidate has a varied, rich, and fully satisfying scientific production for the position of "Professor"; 2. She is a well-known researcher and creator nationally and internationally known for her work in the field of vertebrate zoology, sued also by the significant number of citations of her scientific work.

After the detailed analysis, the general impression from the documentation submitted is that the overall scientific activity of Assoc. Prof. Zlatanova can be characterized as large in volume, diverse, and with high scientific metrics.

## **2. General description of the applicant's activities**

### ***Evaluation of the candidate's teaching and pedagogical activity and preparation***

The teaching qualities, skills, and competencies of the candidate, as well as the teaching products she has created, are an important element in the competition for a professorship. Assoc. Prof. Zlatanova teaches a voluminous range of courses, which requires extensive knowledge, skills, and

competencies in the field of vertebrate zoology. She has developed curricula in "Application of GIS in Biological Research", "Methods for Mapping and Analysing Field Data in GIS", "Data Analysis in Geographic Information Systems", "Principles of Captive Wildlife Breeding and Rearing", and "Methods for Vertebrate Research". She has also prepared two textbooks, "Vertebrate Zoology Exercise Notebook" for a two-semester course and for a short course. The number of Bachelor, Master, and Ph.D. students who have defended under her supervision is also impressive (27). In addition to good teaching practices, the candidate's activity and organizational skills in the operational management and organization of the main teaching activities and several scientific events and forums can be noted. This enables me to highly appreciate the teaching qualities, activity, and realization of the candidate.

### *Evaluation of the candidate's scientific and applied activity*

#### **I. Contributions of fundamental scientific value in the field of zoology**

##### **Thematic area 1: Assessment of the species composition, distribution, and biotope affinities of vertebrates in Bulgaria (papers G7-1, G7-3, G7-7, G7-9)**

- For the first time, a complete inventory of the vertebrates of Lyulin Mountain was made. A total of 12 species of amphibians and reptiles, 46 species of birds, and 11 species of mammals were recorded. For the first time in the region, the golden eagle was found.
- For the first time, key microhabitat characteristics for the distribution of the poorly studied Balkan subspecies of meadow lizard *Lacerta agilis bosnica* - grass height and density - were assessed in three mountains in Western Bulgaria. Age and sex dependence on microhabitat use were found.
- For the first time, the spatial distribution and abundance of vultures and wolves on the Iberian Peninsula and the Balkans were compared, and higher numbers of vultures were found in wolf-free areas.
- The mosaic structure in the distribution of goldenrod has been confirmed, with a new locality recorded outside its known range.

##### **Thematic area 2: Study of positive (mutualism) and negative (competition, predation) interspecific relationships of vertebrates in Bulgaria (papers B4-1, B4-4, B4-7, B4-8, D7-2, D7-8, D8-1)**

- The feeding and behavior of the wolf (*Canis lupus* L.) have been assessed.

- ✓ The actual active choice of prey - the most energy-efficient per unit hunting effort (anti-apostolic approach) was evaluated by applying an objective approach - photo traps.
- ✓ For the first time, the non-agonistic behavior of a male individual towards a pack of feral dogs is reported based on real photo trap registration.
- The feeding, spatial and temporal ecological niches of 17 mammal species and 2 bird species in natural conditions and in artificial feeding sites were studied.
  - ✓ For the first time in the world literature, the trophic competition of 14 mammalian species at artificial feeding sites was examined and temporal displacement was found to be an avoidance mechanism. The dispersal influence of bears on ungulates in these habitats was rejected.
  - ✓ For the first time in Bulgaria, the trophic, spatial, and temporal ecological niches of sympatric *Vulpes* and *Martes* species in two mountains different in their resources - Vitosha and Pirin have been studied in a complex and simultaneous way. Seasonality in overlapping foraging niches and complete overlapping of spatial niches were found.
- For the first time, data on the use of feeding sites by marked Griffon Vultures were analyzed, and longer feeding periods were found during the incubation period of the birds. The influence of predators and *Corvus corax* crows as disturbance factors and foraging competitors for Griffon Vultures were recorded.
- For the first time in Bulgaria, the availability of food resources as a prerequisite for the selection of the nesting habitat of the Imperial Eagle (*Aquila chrysaetos*), the White-tailed Buzzard (*Buteo rufinus*), and the Peregrine Falcon (*Falco peregrinus*) in the Balkan Mountains was assessed. The species constituting the food resources of the studied species were identified.
- For the first time, the food spectrum of the wolf in three regions of Southwestern Bulgaria was studied, demonstrating its dependence on the specific characteristics of the prey and the anthropogenic influence of the studied areas.

**Thematic area 2: Characterization of behavioral aspects of mammals in habitat resource utilization and threat avoidance using GSM/GPS telemetry and analyses in Geographic Information Systems (GIS) (papers B4-2, B4-3, B4-5, D7-10)**

- Brown bear (*Ursus arctos* L.)

- ✓ For the first time, the management of undesirable behavior (aversive reversal) following capture and handling has been investigated and found to be an effective tool (at least in the short term) for 'driving' the species away from areas where it is causing damage.
- ✓ The size of the individual territory was determined, and it was shown that its size is not correlated with the density of feeding sites, and the hibernation site of the species is almost in the very center of the core area.
- Red deer (*Cervus elaphus* L.)
  - ✓ For the first time in Bulgaria, the home range and mobility in four regions in Bulgaria - Central and Eastern Balkan Mountains, Ludogorie, and Western Rhodopes were analyzed. A comparative analysis of the sizes of the home range of the species in Bulgaria and in Western Europe was carried out and a larger size of the core area of the hind in Bulgaria was found.
- Badger (*Meles meles*, L.)
  - ✓ The process of releasing captive-bred badgers back into the wild is traced for the first time, following the stages of acquisition of new habitats for the individuals.

**Thematic area 3: Testing new approaches to studying the distribution and biology of mammals (papers C4-6, D7-6, D7-11 ).**

- A comparative analysis of the mammal diversity in the Osogovo Mountains is made using three field designs with different durations and positioning schemes of the photo trap locations. It is demonstrated:
  - ✓ the effectiveness of photo traps for recording new species (in this case *Vormela peregusna* L.);
  - ✓ that a grid-based design works best for very short study periods, and that an opportunistic positioning scheme based on expert opinion provides good results for longer-term studies.
- For the first time in Bulgaria, a comparison was made between three field methods for monitoring mammals (direct observations, counting tracks in snow, photo traps) with a target species of roe deer *Capreolus capreolus*. Recommendations are made to use at least one of these three methods to calibrate official taxation.
- For the first time, the advantages and disadvantages of different capture techniques and the use of radio implants in badgers were evaluated. The first radiotelemetry and internal

body temperature data obtained using an implant-embedded temperature sensor are also presented.

## **II. Contributions of applied scientific value in the field of vertebrate zoology (papers G7-5, G8-1, G8-2, G8-3, G8-4, G8-5, G8-6, G7-4)**

- An action plan has been developed for the subspecies of the wild goat - Balkan wild goat (*Rupicapra rupicapra balcanica*, Bolkay, 1925) for the period 2022-2031.
- For the first time, an analysis of the transport infrastructure as a source of barriers for the wolf was made and it was found that the permeability of the Trakia highway is almost three times lower than that of the Hemus highway. All alternatives proposed for the under-construction Struma motorway are analyzed and recommendations are made to avoid habitat fragmentation.
- For the first time in Europe, the current status of ungulate management in 209 European national parks in 29 countries has been assessed.
- A new assessment has been prepared for the European wildcat (*Felis silvestris*) according to the IUCN Red List category and criteria.
- Information on the wolf - numbers, trends, and main threats and conservation measures at population, country, and pan-European levels were updated in order to prepare an updated assessment of the conservation status of the wolf in Europe.
- Analysis of Important Bird Areas (IBAs)
  - ✓ Bacarluka - with 172 bird species, of which 66 are included in the Red Data Book for Bulgaria and 73 are of European conservation concern (SPEC).
  - ✓ Osogovo - with 111 bird species, of which 13 are included in the Red Data Book for Bulgaria and 35 are of European conservation concern (SPEC).
- For the first time, the level of approval of the brown bear among students aged 10-18 years in four European countries was analyzed. It was found that lower levels of bear acceptance were associated with fear of the species, and acceptance of the species was not higher in countries with bear presence. Urban residents were more likely to accept the species well.

### **3. Summary comments and personal impressions**

The analysis of Associate Professor Zlatanova's professional development shows that she has shaped herself as a lecturer and researcher at Sofia University with a distinct profile and high



qualifications, fully corresponding and coinciding with the topic of the announced competition for "Professor". Her active publishing activity in terms of volume, content, and quality meets and exceeds the requirements for the position of "Professor" at the Faculty of Biology. Her research activity correlates with the candidate's varied teaching and learning activities. I assess the candidate's research and teaching contributions as highly complex. They develop important problems of vertebrate biology and ecology and address them in a multifaceted way.

I have had personal impressions of Associate Professor Zlatanova since 2011. She is an active, constructive, and dialogical person who supports her colleagues and students. I believe that she has found her niche in zoological research and is persistently striving to expand it in the direction of teaching, participation in research projects, curriculum development, and new courses in modern subjects.

## **CONCLUSION**

The documents and materials submitted by Assoc. Prof. Dr. Diana Zlatanova meet all the requirements of the law on the development of academic staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of the LDASRB, and the relevant Regulations of Sofia University "St. Kl. Ohridski".

The candidate in the competition has submitted a significant number of scientific works published after the materials used in the defense of the Ph.D. Thesis and the competitions for assistant professor and associate professor. The candidate's works contain original scientific and applied contributions that have received international recognition, a representative number of which have been published in refereed journals and scientific proceedings published by international academic publishers. Her theoretical developments have practical applicability, as some of them are directly oriented to teaching work. The scientific and teaching qualifications of Assoc. Prof. Zlatanova is undoubted and cannot be questioned.

The achievements of Assoc. Prof. Zlatanova's results in teaching and research activities fully comply with the minimum national requirements for the academic position of "Professor".

After familiarizing myself with the materials and scientific works presented in the competition, analyzing their significance and the scientific and applied contributions contained in them, I find it justified to give my positive assessment and to recommend the Scientific Jury to prepare a report-proposal to the Biological Faculty Council of Sofia University Dr. Diana Peneva Zlatanova to be elected at the academic position of "Professor" at the Biological Faculty of Sofia University. "St. Kl.

Ohridski" in the professional field 4.3 Biological Sciences (Zoology of Vertebrates, Geographic Information Systems).

09.04. 2023 г.

Reviewer: .....

*(signature)*

Assoc. Prof. Dr. Tsenka Chassovnikarova