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S T A T E M E N T
by Prof. Dr. Milcho Todorov Todorov
Institute of Biodiversity and Ecosystem Research, BAS
member of a scientific jury, appointed by Order No. 45/20.06.2024
of the Director of IBER-BAS

Regarding: competition for the occupation of the academic position "Associate Professor (Docent)" in the field of science 4.3. "Biological Sciences", scientific specialty "Hydrobiology", for the needs of the research group "Invasive alien species", Section "Biodiversity and Functioning of Freshwater Ecosystems" at the Department "Aquatic Ecosystems" of IBER-BAS.

For participation in the announced competition, only one candidate submitted documents - **Dr. Hristina Vasileva Kalcheva**, Chief Assistant Professor in the Section "Biodiversity and Functioning of Freshwater Ecosystems" at the Department "Aquatic Ecosystems" of IBER-BAS. The materials submitted for the competition, announced in No. 36/23.04.2024 of the State Gazette, include all the required documents and are in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its implementation and the Regulations on the terms and conditions for acquiring scientific degrees and occupying academic positions at IBER–BAS.

Brief biographical information

After completing her secondary education, in the period 1980-1985, Hristina Kalcheva worked as a dental nurse in the IV City United Hospital – Sofia. In 1984, she obtained a bachelor's degree at the Medical College of the Medical University – Sofia, with the qualification of nurse – general profile. In 1990, he obtained a master's degree in biology at the Faculty of Biology of Sofia University “St. Kliment Ohridski”, specializing in hydrobiology and water conservation. In the period 1990-2005, she worked as a medical and dental nurse at the Medical University – Sofia. From October 2005 to March 2009, she was a full-time doctoral student at the Institute of Zoology, BAS, and in 2011 successfully defended her PhD thesis at IBER, BAS on the topic "Trophic importance of bacterioplankton in stagnant freshwater ecosystems - interactions with abiotic and biotic factors in the pelagial". From 2009 until now, she has been carrying out research activities and has successively worked as a specialist biologist, assistant and chief assistant at the Institute of Zoology and the Institute of Biodiversity and Ecosystem Research at the BAS.

Description and evaluation of the presented materials

Dr. Kalcheva presented a list of 42 publications, 7 of which are related to the acquisition of the educational and scientific degree "PhD" (group of indicators A1 - dissertation articles). Another 11 articles are in non-IF/SJR journals or reports published in conference proceedings and are not subject to evaluation in the competition. The candidate participates in the current competition with 24 publications, of which 20 are referenced and indexed in world-renowned scientific information

databases (*Web of Science* and/or *Scopus*) (7 from group **B4** and 13 from group G7). Of these, 16 were published in IF journals (Q2 – 2, Q3 – 12 and Q4 – 2), and 4 in SJR-ranked journals only. The list also includes 4 scientific works referred to indicator **G8** (Published book chapter or collective monograph with ISBN). Given the nature of the scientific problems developed by Dr. Kalcheva, all the publications on the competition are collective, and in 3 of them she is the first author, in 4 - the second author, and in 17 - the third and subsequent author. In general, the number and quality of the works presented fully meet the minimum national requirements and the minimum requirements of the BAS for occupying the academic position "associate professor", as well as Art. 3 (3) item 5 of the Regulations on the terms and conditions for acquiring scientific degrees and occupying academic positions at IBER–BAS (Amended 25.11.2022).

In the attached list of citations of the candidate's works, a total of 98 citations are indicated. Of these, for the purposes of the competition, 60 citations in journals, referenced and indexed in world-renowned scientific information databases (*Web of Science* and *Scopus*) are presented, 46 of which are in IF journals. Dr. Kalcheva's active participation in national and international scientific forums is impressive. Results of research with her participation have been presented in the form of 14 reports and 21 posters in 24 scientific forums. A list of 27 published abstracts from 18 international scientific forums is attached. Along with the competition documents, Dr. Kalcheva also indicated another publication activity, presenting a list of 7 of her participations as a guest editor of a journal issue or editor of the Book of Abstracts. Dr. Kalcheva's active participation in projects is also impressive – since 2008 she has participated in 14 national and international projects funded by the EU, IAD, the Hungarian Academy of Sciences, Ministry of Environment and Water and National Science Fund.

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 the publications (including their citations) of Dr. Hristina Kalcheva, is respectively 6 in *Scopus* and 5 in *Web of Science*.

Research topics and scientific contributions

Dr. Kalcheva's research activities are generally in the field of hydrobiology, and her research interests cover a wide spectrum and can be summarized as follows:

- **Freshwater Microbial Ecology and Complex Ecosystem Research:** Research is focused on the dynamics in quantitative indices of bacterioplankton in freshwater ecosystems, both seasonally and spatially, and tracing the relationships of bacterioplankton with various environmental factors and with other communities (phytoplankton, zooplankton, macrophytes, fish, etc.). Bacterioplankton was studied in different types of wetlands in the floodplain terrace of the Middle and Lower Danube, as well as in reservoirs with and without the presence of the invasive zebra mussel (*Dreissena* spp.). An original scientific contribution has been made by the studies in freshwater microbial ecology, the comparative studies in the morphology of wetlands and biogens in the Hungarian and Bulgarian sections of the Danube River, the determination of the Srebarna Lake by microbiological indicators as mesotrophic in contrast to the morphologically established trophic status of the lake as eutrophic, the proposal of the multiple regression equation to more easily measure variables to predict phytoplankton biovolume, the impact of the invasive zebra mussel (*Dreissena* spp.) on the annual, seasonal and spatial changes in the numbers, biomass,

morphotypes and size structure of bacterioplankton in the reservoirs, as well as on increasing dissolved oxygen, increasing Secchi transparency and decreasing phytoplankton in the *Dreissena* spp. populated reservoirs.

- **Invasive alien species: spread, introduction pathways, prevention and management:** The focus is on raising citizens' awareness of the introduction and spread pathways of invasive alien species (IAS) and their increasing role in the loss of biodiversity and ecosystem services in Europe and around the world. Detailed information is presented on the creation, structure, mission and activities of the two new regional networks in this field: the Eastern and Southern European Network on Invasive Alien Species (ESENIAS) and the Network on Invasive Alien Species in the Danube Region (DIAS). Aquatic invasive alien species in the Danube River Basin (DRB) and the Western Black Sea Coast (WBSC) are reviewed and species lists, introduction pathways and distribution, impacts and management strategies are presented.
- **Influence of organic fertilization on primary production and other environmental factors in carp fishponds:** In seven fishponds at the Institute of Fisheries and Aquaculture in the city of Plovdiv, three of which were fertilized with manure (beef) manure, and the rest designated as control, a three-year study was conducted to investigate the relationships between biotic and abiotic factors, their influence on primary production (PP) and the effect of fertilization on fish ponds. These studies have an applied character and can contribute to increasing the production of carp ponds and to improving existing practices for better production management and better water quality in fish farms.
- **Application of statistical methods in data analysis in other studies:**

(1) Hydrobiological studies (Investigation of pearls (Insecta: Plecoptera) in the benthal). Through the use of multivariate analyzes (CCA) and non-parametric Spearman correlations, the main environmental factors that determine the species distribution and abundance of the family Taeniopterygidae in Bulgarian rivers have been established. The conservation status of some of the species was assessed according to IUCN criteria, and of the 17 species recorded, one is Regionally Extinct (RE), 9 are Critically Endangered (CR), 3 are Endangered (EN) and one is Vulnerable (VU). From a zoogeographic point of view, 4 species of Taeniopterygidae established in Bulgaria are endemic - one is a Bulgarian endemic (only in the Rhodopes), and three species are Balkan endemics. The research has contributions to fauna, ecology and biodiversity conservation;

(2) Ecological studies (forest ecosystems). The relationship between tree radial growth (RWI) and tree traits (indices) was assessed by linking tree-ring data and traits. For this purpose, 50 locations in 12 countries for 2 tree species (*Picea abies* and *Quercus rubra*) have been selected from the International Tree Ring Database. The application of knowledge about tree growth strategy can be applied in selecting suitable tree species and increasing forest income;

(3) Ecotoxicological studies with pesticides. The impact of the herbicides paraquat (PQ) and glyphosate (G) on the germination and early development of standard test plants - watercress (*Lepidium sativum* L.) and radish (*Raphanus sativus* var. *radiculata* L.) was investigated. Molecular analyzes (PCR) performed showed mutational rearrangements in the DNA of herbicide-treated plants, which is evidence of a response at the DNA level. Genetic analysis using ISSR markers (Inter-Simple Sequence Repeat technique with 10 primers - 8 dinucleotide and 2 trinucleotide) to amplify different genomic regions shows that plants respond to herbicide stress through changes at

the DNA level that are generally dose-dependent and are at least partially stress-specific. The applied ISSR profiling technology is a suitable tool to identify both G- and PQ-induced mutations.

Conclusion

The complex assessment of the activity of Dr. Hristina Kalcheva shows that she is an established specialist in the field of hydrobiology, with an emphasis on freshwater microbial ecology and the study of bacterioplankton. On the basis of the documents presented and the candidate' scientometric indicators, I am convinced that he fully meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its implementation and the Regulations on the terms and conditions for acquiring scientific degrees and occupying academic positions at IBER–BAS. All this gives me a reason to positively evaluate the overall activity of Dr. Kalcheva and to recommend to the respected members of the Scientific Jury and the Scientific Council of IBER–BAS to support the election of Dr. Hristina Kalcheva for the academic position "Associate Professor" in the field of science 4.3. "Biological Sciences", scientific specialty "Hydrobiology", for the needs of the Section "Biodiversity and Functioning of Freshwater Ecosystems" at the "Aquatic Ecosystems" Department of IBER–BAS.

Sofia, 05.08.2024

Member of scientific jury:

/Prof. Dr. Milcho Todorov/