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OPINION

By assoc. prof. Yanka Presolska, PhD
Institute of biodiversity and ecosystem research, Bulgarian Academy of Sciences

Regarding: Contest for the position "associate professor" in the field of "Hydrobiology" within the "Invasive alien species" RG, division "Biodiversity and Functioning of Freshwater Ecosystems", "Aquatic ecosystems" department at the Institute of biodiversity and ecosystem research, BAS, announced in the Official Gazette №36/23.04.2024

General information

Hristina Vasileva Kalcheva, PhD, on a current position assist. prof. in the "Aquatic Ecosystems" department at IBER-BAS, is the only candidate in this competition.

Hristina Kalcheva has graduated as a MSc in biology in 1990 at the Faculty of Biology of the "St. Kliment Ohridski" Sofia University, with a specialization of "Hydrobiology and Aquatic Conservation". In 2011 she obtained an educational and scientific degree "doctor" in the field of "Hydrobiology" as a regular PhD student in the Institute of zoology at the Bulgarian Academy of sciences.

The applied biographical reference attached to the set of documents, reflects in detail the candidate's activity regarding the qualification acquired, incl. Mastering and applying of modern research methods (including statistical), applicable in hydrobiology. Her professional realization is connected not only with research (participation in projects, field, experimental and laboratory work, analysis and publication of data), but also with organizational and editorial activity (as a guest editor or editor of conference proceedings).

Candidate's scientific production

As a result of her research activity, Dr. Kalcheva is the author or co-author of 42 scientific publications, of which 22 are referenced and indexed in world-renowned scientific information databases (Web of Science *и/или* Scopus) (App. 7).

In the current contest Dr. Kalcheva participates with 24 publications (excl. the 7 articles referred to the dissertation, App. 6), of which 16 are indexed in WoS (all 7 articles from group B and 9 - from group G.7), and four - in journals only with SJR. The distribution of the articles by quartiles is as follows: two in Q2, 12 - in Q3 and two – in Q4. The list also includes four scientific works referred to indicator G.8 (Published book chapter or collective monograph). She is a leading author in three of the presented publications, and in eight - the second or third co-author. The

candidate's H-index is 5 (WoS). I fully accept the self-assessment report presented and I consider it has been prepared correctly and in accordance with the requirements of ZRASRB. The total number of points on the scientific production presented by Dr. Kalcheva for participation in the benchmark competition is as follows:

- group B – 102 points (of minimum 100);
- group G – 246 p. (of minimum 220);
- group D – 120 p. (of minimum 60).

Research topics and scientific contributions

The candidate's scientific and applied contributions (App. 9) outline research interests in the following areas:

- **Freshwater microbial ecology and complex ecosystem studies**

The main emphasis is research on bacterioplankton - abundance, size structure, morphological groups, seasonality and spatial distribution in wetlands of different types in the floodplain terrace of the Middle and Lower Danube and the Danube River itself. Original scientific contributions in the field of aquatic microbial ecology and bacterial taxonomy are presented, incl. purple phototrophic bacteria, analyzed and statistically substantiated are the relations established by the candidate between the biomass of individual plankton communities in the grassland food chain, as well as the functioning of wetlands as a source or sink of biogenic elements. The long-term changes of nutrients (nitrogen and phosphorus) were investigated and their role in predicting the bio volume of phytoplankton with increased accuracy was analyzed.

- Invasive alien species - distribution, paths of introduction, prevention and management

The role of invasive alien species (IAS) as one of the main direct drivers of the biodiversity loss and ecosystem services on a European and global scale, as well as the evaluation of ecosystems with globally significant biodiversity, incl. water ecosystems, as the most vulnerable to the impact of IAS and the need for their special protection, is analyzed. Based on recent data of recorded introductions and distribution of alien species, their potential impact on local freshwater biota is investigated. A significant scientific-methodological contribution is the attempt to apply a new approach for the assessment of the trophic and ecological status of surface standing water bodies affected by invasive mussels, based on their abundance and not their mere presence or absence in the proper water body.

- Influence of organic fertilization on primary production and other environmental factors in carp fishponds

The relationships between biotic (zooplankton, phytoplankton, zoobenthos, chlorophyll-a, macrophytes, bacterioplankton, percentage of energy absorption through primary production) and abiotic variables, their influence on primary production and the effect of manure fertilization in fishponds for intensive fish production are investigated. Correlations between different variables are analyzed, and the results provide guidelines for improving of existing practices for better production management in fish farms.

- Application of statistical methods in the analysis of data from hydrobiological, ecological and ecotoxicological studies

Correlations and regression equations of different strength and direction were studied in the analysis of spatial and structural variations in the main taxonomic groups of plankton communities. An original scientific contribution is the first derived very strong multiple regression equation between phytoplankton biovolume as dependent and water level, chlorophyll-a and dissolved inorganic nitrogen as independent variables (R=0.93), which allows to predict phytoplankton bio volume by -easily measurable variables with better accuracy. By means of multivariate analyzes (CCA) and non-parametric Spearman correlations, the ecological characteristics of individual species of the order Plecoptera were analyzed and the influence of main abiotic factors on their distribution and numbers was analyzed.

Citations

The list attached to the documents (App. 8) includes a total of 98 citations, of which 60 are in articles published in WoS and/or Scopus indexed journals, 25 - in other scientific publications and 13 - in dissertations in Bulgaria and abroad. The citation of the scientific production is directly related to the specifics of the candidate's research area, but despite this, it exceeds twice the mandatory minimum of 60 points.

Critical remarks and recommendations

The way of which contributions 4.2 and 4.3 are presented largely does not reflect the applicant's actual contribution as a co-author. Dr. Kalcheva skillfully handles a number of modern statistical programs and successfully interprets the obtained results, that is why she is a valuable co-author outside the framework of freshwater ecology. In this regard, I recommend her to emphasize her personal contribution when covering collective publications.

CONCLUSION

Dr. Hristina Kalcheva fully meets the mandatory national requirements, the requirements of the BAS and those of IBEI-BAS for holding the academic position "associate professor". For me personally, she is an active and purposeful researcher with extensive expertise in the field of bacterial plankton communities and freshwater ecology, whose scientific output finds a good response among scientific

community. I believe that her habilitation will stimulate her for further professional development, but will also strengthen and enrich the research topics and capacity not only of the Invasive Alien Species IG, but also of the Biodiversity and Freshwater Ecosystem Functioning Section as a whole. These are my reasons for giving a **positive assessment** of the candidate's scientific results and to recommend to the Scientific Council of IBEI to award Assistant Professor Hristina Vasileva Kalcheva, Ph.D., with the academic position of "associate professor" in the specialty "Hydrobiology".

Sofia, August, 19th, 2024 Signature:

(assoc. prof. Y. Presolska, PhD)