Вх. № 727/НО-05-06/25.07.24 г.

R E V I E W

of research and teaching activities

of Assoc. prof. Emilia Varadinova, PhD

about the competition for the academic position

“Professor”

by Prof. Eliza Petrova Uzunova, PhD

from the Department of General and Applied Hydrobiology at the Faculty of Biology

Sofia University "St. Kliment Ohridski"

This review was prepared according to Order RD-41/27.05.2024 of the Director of IBEI - BAS for a member of the Scientific Jury for holding a competition for the academic position of "professor" in the field of higher education: code 4. "Natural Sciences, maths and IT"; Professional direction: 4.3. "Biological Sciences"; Scientific specialty: "Hydrobiology" at the IG/Section/Department "Aquatic Ecosystems" for the needs of IBEI-BAS, announced in SG no. 27 of 29.03.2024 The only candidate in the competition is Assoc. Dr. Emilia Varadinova, an employee at IBEI-BAN.

This review was prepared on the basis of a decision of the Scientific Jury, adopted at a meeting of June 12, 2024. The documentation submitted by the candidate meets the requirements of both the Law on the Development of the Academic Staff in the Republic of Bulgaria (with the amendments of February 25, 2020), the Regulations for the Application of the Law on the Development of the Academic Staff - SG No. 19/02/2019), as well as the Regulations for the conditions and procedures for acquiring scientific degrees and occupying academic positions at IBEI-BAS. The technical documentation is designed and arranged in accordance with the inventory in the Application for participation in the competition.

1. **Data on the candidate's career development**

Emilia Dobrinova Varadinova (born on 21.08.1967) graduated from Sofia University "Kliment Ohridski" in 1991 with a master's degree in "Biochemistry and Microbiology". In 2007, he successfully defended his thesis on "Composition, dynamics and indicator potential

of the functional trophic groups of the macrozoobenthos in the Mesta River", in area 4.3. Biological Sciences. Scientific specialty "Hydrobiology" and received the scientific and educational degree "doctor".

The professional development of Dr. Emilia Varadinova passed through the position of biologist-ecologist (1994-1996) in the Institute of Ecology, section "Ecological Genetics and Protection of Natural Ecosystems", and after 1996 she moved to the section "Biological Monitoring" and "Bioindication and environmental risk". In the period 2010-2014, he was the chief assistant at the "Ichthyology and Fish Resources" section, "Aquatic Ecosystems" department at IBEI-BAS, and from 2015 until now he held the position of "associate professor" at the Institute of Biodiversity and Ecosystem Studies (BAS), as well as at Southwestern University "Neofit Rilski", Blagoevgrad, Faculty of Natural Sciences, Department of Geography, Ecology and Environmental Protection.

The expansion of the candidate's scientific training is also carried out through the participation in international specializations (three) and courses to increase the qualification. The latter are in the field of mapping, Geographic Information Systems, statistical methods and modelling in ecological research.

2. Main areas of the candidate's research work and most important scientific contributions

I accept the report presented by Dr. Emilia Varadinova about the contributions to her scientific publications with the remark that it does not clearly state which of the contributions she mentioned are confirmatory and which are original. The candidate systematizes the contributing elements of his research work into four groups. These are: 1) Biodiversity of macrozoobenthos communities; 2) Bioindication and ecological assessment based on macrozoobenthic communities; 3) Preservation of biodiversity and the ecological condition of water bodies and wetlands; and 4) Methodological.

Area: Biodiversity of macrozoobenthos in surface continental waters.

The candidate has a contribution in carrying out large-scale studies of the taxonomic composition and structure of the macrozoobenthos in different types of reservoirs located on the territory of Bulgaria. The research covers dozens of lakes, dams, rivers. The candidate is focused on the study of the trichopteran fauna (order Trichoptera) and has made a personal contribution to the determination of the taxa/species of the class Turbellaria, subclass

Hirudinea, the orders Coleoptera, Odonata, Hemiptera, Megaloptera and Diptera (without the family Chironomidae), as well as the determination of the taxa of the subclass Oligochaeta and the orders Ephemeroptera and Plecoptera to genus/family level.

The candidate contributes to revealing the influence of key abiotic factors (altitude, physical and chemical parameters of water, type of bottom substrate, amount of organic carbon, fluxes in the water level, eutrophication) on the processes of formation of the trophic structure of bottom invertebrate communities. A significant contribution is the long-term monitoring of changes in the benthic invertebrate fauna in the light of the impact of various, mainly negatively influencing anthropogenic factors on these processes in aquatic ecosystems.

Area: Bioindication and assessment of ecological status

A significant contribution of the candidate to the development of science in the field of hydrobiology is its research related to the assessment of the state of aquatic ecosystems, and more precisely the application of knowledge related to the macroinvertebrate fauna for its use as an indicator of past and present events. The application of the macrozoobenthos as an indicator was carried out together with various physical, chemical, other biotic indices and tested both under conditions of anthropogenic load of different nature and in relatively unaffected conditions. These multi-year and wide-ranging studies contribute to the improvement of the quality of the monitoring of the state of water ecosystems in our country, to a better understanding of the processes and dependencies to which the complex processes that take place in water ecosystems are subject and how the trends in these processes can to be "read" through the analysis of the macrozoobenthos fauna. Key to the credibility of the conclusions that are drawn on the basis of this analysis is that they be based on a representative number of experimental data, including different situations, seasons, types of reservoirs, etc. The correct reporting of the MZB indicator in the assessment of the state of the environment was achieved by the applicant on the basis of a study of hundreds of points throughout the country and beyond.

Area: Development and improvement of existing methodologies

The candidate's scientific-applied contribution is the developed new methodology for assessing the ecological status of various standing surface standing water bodies based on the macrozoobenthos biological element. The methodology was included in Ordinance 4 when it was last revised in 2023. The candidate also contributes to the development of a

methodological framework for assessing and mapping the state of ecosystems and ecosystem services in internal wetlands in Bulgaria.

3. **Significance of scientific results and membership in international and national scientific bodies**

The intensive research work of the candidate finds expression in a high publication activity. Dr. Varadinova has a total of over 90 scientific publications (articles and book chapters). To participate in the current competition for a professorship, the candidate has submitted 37 scientific works (refereed articles and book chapters) on the subject of the current competition. The scientific articles (31 in number) are published in specialized and renowned international scientific publications, referenced and indexed in WoS/SCOPUS. The predominant number of publications are in the journals Acta Zoologica Bulgariaca and Ecologia Balkanica, 12 and 10 issues, respectively. Publication of articles in high impact factor journals such as Water, Diversity and Nature, in which the applicant has 4 articles, should be indicated.

The distribution of all articles with which the candidate participates in the magazine competition with quartiles is as follows: with Q1 – 4 articles, with Q2 – 3 articles, with Q3 – 3 articles, with Q4 – 12 articles. Nine articles had no defined quartile, only SJR.

The total **IF** of scientific publications is **75,665**.

Broken down by metrics, the publications are as follows:

• B4 includes 8 articles forming 128 items distributed by quartiles: with Q1- 2, with Q2 - 1 article, with Q4 - 4 articles and one (1) with SJR;

• D7 includes a total of 23 articles forming 302 items – with Q1 – 2 articles, with Q2 – 2 articles, with Q3 – 3 articles, with Q4 – 8 articles and 8 articles with SJR.

The candidate has also published six (6) chapters, placed in 3 separate books (G8=90 items)

Dr. Emilia Varadinova is the first author in eight of the scientific works presented for the competition, in another 8 she is the second, and in 11 she is the third. In a significant part of the publications, the author teams are made up of more than 4 co-authors. These data demonstrate the ability of Assoc. Prof. Emilia Varadinova for fruitful cooperation with a wide range of specialists in the field of her research and for teamwork - in modern science, joint work is already a natural phenomenon and everywhere in the world it is highly valued,

especially when develop topics related to problems in the ecological state of the environment, which must necessarily be considered comprehensively.

Proof of the importance of Assoc. Prof. Varadinova's published research is their citation. The total number of noticed citations of all publications in referenced and indexed in world-famous scientific information databases (Web of Science and Scopus) of Dr. Varadinova (without self-citations) is 147, h-index = 6 (Web of Sciences). The most cited article is "The recovery of European freshwater biodiversity has come to a halt" published in the journal Nature in 2023 with an international team of authors. It is cited 32 times or 22% of all citations in indexed world famous databases.

Dr. Varadinova was included 5 times as a member of scientific juries in competitions for acquiring academic positions (associate professor and professor) and ONS "Doctor" (in 7 juries). Dr. Varadinova has prepared a review of a textbook - "Water Pollution and Impact on Ecosystems" (second revised and supplemented edition, "Paisii Hilendarski" University Press). Dr. Varadinova is a member of the editorial board (advisory board) of the journal Ecologia Balkanica.

Associate Professor Dr. Varadinova is a member of the Council of Coordinators of the European and Global Networks for Long-Term Research, the LTER Network in Bulgaria and site coordinator of the MESTA RIVER site; Member of the Union of Scientists in Bulgaria, Biology Section; Member of IAD - International Association for Danube Research.

Dr. Varadinova has participated in eight organizational and scientific committees of scientific forums. Participated as an expert hydrobiologist in the development of numerous management plans, environmental assessments, environmental impact assessments.

4. Profile of the research work

The research profile of Associate Professor Dr. Emilia Varadinova is clearly outlined. It is formed from her research on macrozoobenthos communities in different categories of surface water, covering both fundamental research and applied research. The presented scientific publications, expert activity and training activity give me reason to conclude that the scientific research profile of the candidate corresponds to the specialty "Hydrobiology" in which the announced competition is.

5. Management of projects and attracted funds

Associate Professor Varadinova has participated in 15 national and 6 international scientific and educational projects, financed by both national (Operational Program "Environment 2007-2013" and others) and international funds (the Financial Mechanism of the European Economic Area, the Program for European Territorial Cooperation INTERREG). She was the head of 6 national projects. Their number clearly shows that Dr. Varadinova conducts active research activities and is a sought-after partner in research teams with her knowledge in the field of hydrobiology and the protection of aquatic ecosystems. In the materials submitted for my review, I did not find that specific funds (such as monetary resources or material assets) were indicated that the applicant attracted to the organization for which he worked, as a result of his participation in the specified projects.

6. Educational and teaching activity

Dr. Emilia Varadinova began her teaching activity in the period 1995-1996 by teaching the exercises from the course "Biogeochemistry of the landscape", specialty "Engineering Ecology" at Southwestern University, Blagoevgrad.

From 2015 until now, she has been a full-time teacher at the "N. Rilski", Blagoevgrad in the following academic disciplines: "Water pollution and impact on ecosystems", Water resources management, Methods for analysis and assessment of the state of water, "Ecological monitoring", "Air pollution and impact on ecosystems", Pollution of of air and water", "Environmental requirements and norms" and others in bachelor's and master's programs in the specialties "Ecology and environmental protection, "Geography and regional development", "Chemistry and ecology", "Eco PR" of SSU "N. Rilski" Blagoevgrad. In PU "P. Hilendarski" is a part-time teacher, and at the University of Forestry he is a guest lecturer in the course "Water Pollution and Impact on Ecosystems".

Dr. Varadinova has increased her professional qualification as a teacher by specializing in the field of educational activity specifically related to the application of innovative learning models in higher education (Spiru Haret University, Bucharest, Romania, 2023).

Outside the system of higher education, Dr. Varadinova takes part as a training lecturer in several seminars, in which she conducts training for employees of the EAES and other specialists from the system of the Ministry of Education and Culture.

Dr. Varadinova and was the supervisor of two successfully defended doctoral students. One of them defended with a scientific specialty "Hydrobiology" at IBEI-BAS and for whom Dr. Varadinova was the only scientific supervisor. The other doctoral student defends a dissertation in direction 4.4. Earth Sciences, scientific specialty "Ecology and Environmental Protection" at SSU "N. Rilski", Blagoevgrad and of which Dr. Varadinova is the scientific supervisor together with Assoc. Prof. Dr. Sekelarieva. The two supervisors have expertise in different professional areas, 4.3. Biological Sciences and 4.4. Earth Sciences, respectively.

7. **The fulfillment of the minimum national requirements in terms of indicators for occupying the position of "Professor" is as follows**

The reference on the fulfillment of the minimum national requirements by the applicant for scientific area 4. Natural sciences, mathematics and informatics; professional direction 4.3. Biological Sciences shows a range of points that cover, and in most cases exceed, the required minimum number of points for the criteria.

The fulfillment of the minimum national requirements in terms of indicators for occupying the position of "Professor" is as follows:

The indicator from group "A" is covered by 50 items; According to the group "B" indicator, no points are required for this position; Group "B" indicators are covered by 128 points (out of 100 required); Group "D" indicators are covered by 392 points (with 220 required);

The indicators from group "D" are covered by 294 p. (with 120 required). Group "E" indicators are covered by 470 points (out of 150 required).

Total points by indicator group A+B+D+D+E is equal to **1334** points (with 640 required). **This shows that the candidate fully meets and twice exceeds the requirements by the law.**

8. **Critical remarks and recommendations**

Critical remarks: I have no critical remarks about the candidate's scientific production in general. The candidate's publications are of high quality, have been published in specialized scientific journals and have been subject to peer review.

Recommendations: I would recommend the candidate to continue active publishing, seeking to further increase the visibility of their research through a focus on publishing in WoS/Scopus first and second quartile journals. Another recommendation is to include in the

candidate's research team more students from different educational levels, but mostly graduates. This will create conditions for continuity and confirmation of a scientific school in the field of macrozoobenthic community research in our country. I highly recommend the candidate to devote time and effort to the compilation of a textbook or other type of educational literature (e.g. practical guide) or a monograph that will best present the research done, and especially to the Bulgarian hydrobiological community to which I belong first of all, researchers, teachers and students, but also employees of the Ministry of Environment and water, and non-governmental organizations.

9. Personal impressions of the candidate for professorship

I know Dr. Emilia Varadinova personally. For me, she is an active, motivated researcher with a clearly defined scientific research profile in the field of the biodiversity of the macrozoobenthos fauna, biological monitoring, protection of aquatic ecosystems. In our professional contacts, she has always been responsive and willing to help. I should also share the impressions of the students from the Faculty of Biology of SU, who had the opportunity to work under her guidance. I believe that this joint work has a significant role in shaping the research interests of young people and has contributed to directing them towards hydrobiological science.

CONCLUSION

The documents and materials presented by Dr. Emilia Varadinova meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the low and the relevant Regulations on the terms and conditions for acquiring scientific degrees and holding academic positions in IBEI-BAS. In the competition for professorship, Dr. Emilia Varadinova has provided sufficient evidentiary materials that show that she meets the requirements for holding the position of "professor". The candidate's profile fully corresponds to the thematic profile for which the competition was announced. The candidate's scientific and scientific-applied results show that she is an established scientist in her field and as a professor will be able to contribute to the successful development of the "Aquatic Ecosystems" department - the unit for the needs of which the competition was announced. My acquaintance with the materials and scientific works of Dr. Varadinova presented for the competition, and my analysis of their significance and the scientific and methodical contributions contained in them, give me reason to convincingly vote "FOR" her candidacy and to recommend to the respected members of the Scientific Jury

to prepare a report-proposal to the Scientific Council of IBEI-BAS for the election of Associate Professor Dr. Emilia Varadinova to the academic position of "Professor" in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional direction 4.3. Biological sciences, Scientific specialty: "Hydrobiology".

Sofia

Reviewer:

(Prof Eliza Uzuznova, PhD)