

OPINION

From Prof. Dr. Valentina Ilieva Markova, Technical University – Varna

on the materials submitted for participation in the competition for occupying the academic position of “Associate Professor”

field of higher education – 4. Natural Sciences, Mathematics and Informatics, professional field – 4.4. Earth Sciences, scientific specialty – *Oceanology*; scientific area: *Application of data science, machine learning, statistical and numerical methods in marine sciences*

In the competition for the position of Associate Professor, announced in the State Gazette, issue 63/01.08.2025, the sole candidate is Chief Assistant Dr. Ivelina Yordanova Zlateva, Chief Assistant in the “Sea Physics” Section at the Institute of Oceanology – Bulgarian Academy of Sciences.

1. General Description of the Submitted Materials

In connection with the competition for occupying the academic position of “Associate Professor”, Chief Assistant Dr. Ivelina Zlateva participates with 27 titles, of which 20 are published in editions referenced and indexed in Web of Science / Scopus. In addition to the report verifying compliance with the minimum national requirements and those of the Institute of Oceanology – BAS related to the competition, one scientific and technical report has been submitted. The materials are categorized as follows:

Total number of scientific publications (papers and articles) – 27 (including publications in refereed and non-refereed editions, book chapters, and conference papers)

- Scientific publications included in the habilitation work – 6 (B4.1 – B4.6)
- Scientific publications outside the habilitation work (indicator G7) – 14 publications (G7.1 – G7.14)
- Publications in non-refereed editions (indicator G8) – 7 publications (G8.1 – G8.7)
- Papers presented at international conferences (in Bulgaria and abroad) – 7 (6.3.3-2, 6.3.3-3, 6.3.3-5, 6.3.3-6, 6.3.3-7, 6.3.2-9, 6.3.2-14)
- Articles in specialized scientific journals (in Bulgaria and abroad) – 13 (including Marine Pollution Bulletin, Nature Conservation, Journal of Marine Science and Engineering, Oceanologia, Acta Zoologica Bulgarica, Ecologia Balkanica, etc.)
- Book chapters (indexed in Scopus) – 5 (6.3.2-1, 6.3.2-9, 6.3.2-11, 6.3.2-12, 6.3.2-14)
- Publications indexed in Scopus/WoS (refereed) – 20 (all under indicators B4 and G7 – total of 20 articles/chapters)
- Publications in non-refereed editions – 7 (all under indicator G8 – 6.3.3-1 to 6.3.3-7)
- Publications with Impact Factor (WoS, IF) – 1 (Marine Pollution Bulletin, 2024, IF Q1)
- Publications with Impact Rank (SJR) – 13 (Nature Conservation, Oceanologia, JMSE, Toxins, Frontiers in Marine Science, Acta Zoologica Bulgarica, etc.)
- Publications in English – 26
- Publications in Bulgarian – 1
- First author – 8 publications (B4.1, B4.3, B4.4, G7.4, G7.8, G8.4, G8.6, G8.7)

2. General Characteristics of the Scientific, Applied Research, and Teaching Activity of the Candidate

Chief Assistant Dr. Ivelina Zlateva develops successful research, applied scientific, and teaching activities in the fields of oceanology, marine ecology, and the application of data science, as well as statistical and numerical modeling in marine sciences.

Dr. Zlateva's research activity is focused on the application of interdisciplinary methods for studying the marine environment—combining ecological analyses, modeling of biological communities, and numerical modeling of marine processes. Significant results have also been achieved through the application of data science tools for preprocessing, qualitative analysis, modeling, and post-processing of large multidimensional ecological and climatic datasets.

As a result of these studies, 27 publications have been produced for the Associate Professor competition, 20 of which are in journals indexed in *Scopus* and *Web of Science*, including *Marine Pollution Bulletin*, *Oceanologia*, *Nature Conservation*, *Journal of Marine Science and Engineering*, *Toxins*, *Frontiers in Marine Science*, and others.

These publications demonstrate strong scientific contributions in the areas of sustainable management of marine resources, ecosystem modeling, and the conservation of the Black Sea, with several works published in journals with Impact Factor (IF) and SJR ranking.

Dr. Zlateva actively participates in 18 international and 13 national scientific projects related to the Black Sea, applying her expertise in data analysis, spatial modeling, machine learning, and Python- and R-based ecological modeling.

A *Scopus* reference shows that Chief Assistant Dr. Zlateva has an h-index of 5 and more than 50 citations over the past five years, confirming the international relevance of her work.

The submitted materials also indicate that Dr. Zlateva has notable teaching experience. During her PhD studies, she served as a part-time assistant at the Technical University of Varna, where she conducted laboratory exercises in several disciplines.

3. Scientific, Applied Research, and Practical Contributions

In the materials submitted for the present procedure, a number of contributions of scientific, applied scientific, and practical nature are presented, which I essentially accept and which are the result of the application of an interdisciplinary approach to the analysis and modeling of the marine environment.

The results of the research activity of Chief Assistant Dr. Ivelina Zlateva have significant social and economic impact, expressed in the improvement of the management and conservation of fish resources, the enhancement of monitoring and assessment of ecological risks, as well as in the development of effective approaches for pollution management and protection of the marine environment. The main contributions can be grouped into two directions:

➤ Scientific contributions

- New models of spatial distribution and habitat suitability of key commercial fish species in the Black Sea have been developed using machine learning and the integration of abiotic and biotic factors.
- An integrated approach for combined genetic, morphological, and ecological analysis of turbot populations has been introduced, revealing the relationship between genetic structure and fishing pressure.
- Potentially toxic microalgae and their habitat suitability have been modeled, providing a scientific basis for an early warning system for harmful blooms of potentially toxic species and for the assessment of ecological risks.
- A new methodological framework for the integration of data science in oceanology has been developed using R and Python, supporting the analysis and modeling of large climatic and ecological datasets.

- New relationships between climatic factors, anthropogenic impact, and the dynamics of marine ecosystems have been identified, enriching knowledge on the sustainability of the Black Sea.

➤ ***Applied Scientific and Practical Contributions***

- Models for the spatial distribution and habitat suitability of commercially important fish species have been developed, along with projections for turbot (*Scophthalmus maximus*) under various climate scenarios. The introduced indicators for stock status and sustainable exploitation, as well as the integrated systems for the assessment of marine living resources, have direct applications in the development of management policies and tools for sustainable fisheries, planning of fishing activities, and adaptation to climate change.
- Stratified methodologies and Lagrangian models have been developed for the quantitative assessment of plastic pollution and the identification of “hot spots,” which can be integrated into national and regional monitoring programs and applied within European and international regulations for marine environment management.
- The research has economic and societal impact by optimizing monitoring, increasing the effectiveness of marine conservation policies, and attracting international funding.
- Some of the scientific results have been transformed into educational initiatives and citizen science projects to build ecological awareness and apply scientific knowledge in practice.

4. Critical Remarks and Recommendations

I have no substantial remarks regarding the candidate’s scientific works, which have been prepared and presented in accordance with the requirements and established standards in the scientific field.

5. Conclusion:

In view of the above, I propose that Chief Assistant Dr. Ivelina Yordanova Zlateva be elected as an Associate Professor in the field of higher education 4: “Natural Sciences, Mathematics, and Informatics,” Professional Field 4.4: “Earth Sciences,” Scientific Specialty: “Oceanology,” Scientific Direction: “Application of Data Science, Machine Learning, Statistical and Numerical Methods in Marine Sciences.”

13.11. 2025 г.

Member of scientific jury:

/prof. V. Markova, PhD/