

## OPINION

by Prof. DSc Ivan Iliev Atanasov, AgroBioInstitute, Agricultural Academy, regarding the selection for the academic position of 'associate professor' at the Institute of Oceanology - BAS, Varna, by field of higher education: 4. "Natural Sciences, Mathematics and Informatics"; professional direction: 4.3. "Biological Sciences"; scientific specialty "Ecology and protection of ecosystems", scientific direction "Ecology and molecular taxonomy of marine organisms". The competition was announced in the State Gazette, no. 1 of 02.01.2024

### 1. General presentation of the procedure

By order No. 58/01.03.2024 of the Director of the Institute of Oceanology - BAS /IO-BAS/ I have been appointed as a member of the scientific jury for a competition for the academic position of 'docent' at IO-BAS, in the field of higher education : 4. "Natural Sciences, Mathematics and Informatics"; professional direction: 4.3. "Biological Sciences"; scientific specialty "Ecology and protection of ecosystems", scientific direction "Ecology and molecular taxonomy of marine organisms", scientific section "Biology and ecology of the sea".

One candidate took part in the announced competition for "associate professor" - Ch. Assistant Professor Dr. Nina Stoycheva Dzembekova from the scientific section "Biology and Ecology of the Sea" at IO-BAS. Those presented by Ch. Assistant Professor Nina Dzembekova, materials and documents for participation in the competition comply with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of ZRASRB and the relevant regulations of IO-BAS.

**2. Presentation of the candidate.** Assist. prof. Nina Dzembekova, was born in 1980. In 2004, she graduated from the Technical University - Varna and acquired a Master's degree in Ecology and Environmental Protection. After working as an ecologist at Albena AD in the period 2005-2009, in 2013 she was enrolled in full-time doctoral studies in the "Biology and Ecology of the Sea" section, IO-BAS, where she has been an ecologist since 2016 and subsequently an assistant. In 2018, she successfully defended her PhD dissertation on the topic of 'Molecular taxonomy and ecology of potentially toxic phytoplankton species in the

Black Sea' and obtained the scientific degree "doctor", after which she continued her academic career at IO-BAS, where in 2019 she was elected Chief Assistant Professor. Important for the professional growth of Dr. Dzhenbekova has several short-term and medium-term specializations related to the application of various experimental techniques and approaches, in various research laboratories abroad: Italy (Polytechnic University of Marche Ancona), Japan (National Scientific Institute of Fisheries Sciences, Yokohama) and The Netherlands (CytoBuoy b.v., Voerden), and the country (TU-Varna, MU-Varna, ELTA 90 and Agrobiointitut-Sofia). Excellent command and use of a set of computer programs for processing genetic data, as well as those for working with text and graphic documents, presentations, etc. He speaks excellent English and very good Russian.

In the competition Dr. Dzhenbekova participated with a total of 27 publications, incl. 22 publications in journals refereed in Scopus and/or Web of Science, 3 publications in non-refereed journals and 2 other publications. It should be noted that a large part of the publications in refereed journals are in highly reputable scientific publications, respectively: Q1- 6 items, Q2- 7 items, Q3- 5 items, Q4- 2 items. and editions with SJR – 2 issues. The search in the available scientific literature shows that the previous scientific publications of Dr. Dzhenbekova has been cited 264 times (without self-citations), and the number of citations has been increasing in recent years. Dr. Dzhenbekova actively participates in scientific forums, as the materials for the competition present participation in a total of 14 scientific forums, congresses and conferences, including the presentation of reports and posters. The scientific research activity of Dr. Dzhenbekova is associated with the successful implementation and management of a number of scientific research projects, as Dr. Dzhenbekova participates as a member of the scientific team of a total of 13 international projects (11 funded under various EU framework programs and 2 bilateral) and 7 the projects with national funding (4 funded by the National Research Institute, 2 by the National Center for Polar Research and 1 by the NGO Environment). It should be noted that Ch. assistant professor Dr. Dzhenbekova is the head and coordinator for IO-BAS of two of these projects. Dr. Dzhenbekova is a member of the International Society for the Study of Harmful Algae (ISSHA) and is the winner of the First Prize in the BAS "Best Publication" competition on the topic of the dissertation and the "45 Years IO-BAS" Badge of Honor for the development of the direction "Molecular taxonomy of phytoplankton" on the occasion of the anniversary of IO-BAS.



**3. Scientific research activity. Main contributions.** The main part of the research activity and original scientific contributions of Dr. Dzhenbekova is related to the characterization of phytoplankton biodiversity, as well as the distribution and ecology of toxic, potentially toxic and bloom species of phytoplankton in the Black Sea. To conduct these studies, Dr. Dzhenbekova applies an integrated approach combining modern molecular genetic techniques with classical morphological methods, which allows precise determination of taxonomic affiliation and complex characterization of biodiversity in a wide range of samples. As a result of the application of molecular genetic methods in the conducted research, original results were obtained regarding the species diversity in the genus *Pseudo-nitzschia* and a new representative of this genus for the Black Sea - *P. linea*, as well as new species for the Bulgarian water area - *P. calliantha* and varietal form – *P. pungens* var. *aveirensis*. For the first time, metabarcoding was applied to study the biodiversity of phytoplankton resting stages in surface sediments in the Black Sea, registering 180 operational taxonomic units. A parallel study involving microscopic analysis, metabarcoding and analysis of phycotoxins related to the spread of toxic or potentially toxic phytoplankton species was also carried out. An inventory of *Pseudo-nitzschia* blooms was conducted and the relationship between environmental changes and the spatial distribution and abundance of different cyst morphotypes of the *Scrippsiella acuminata* bloom-associated complex in surface sediments of the Black Sea was investigated. In another group of studies, whole-genome sequencing was successfully applied to characterize the Black Sea microbiome and cultures of *Synechococcus* isolated from 750 m depth in the Black Sea and assess their adaptive potential to survive in anaerobic conditions. By applying a set of molecular methods (whole genome sequencing, metagenomics and qPCR), the spatial distribution and abundance of *Synechococcus* in the Black Sea was characterized. In a third group of studies, the population-genetic structure and health status of valuable commercial fish species in the Bulgarian Black Sea water area were characterized, including *Scophthalmus maximus* (turbot), *Mullus barbatus* (mullet) and *Belone belone* (sea bream). Dr. Dzhenbekova's research also includes characterization of the biodiversity of diatom communities in different substrates and habitats in Antarctica and species identification of Antarctic diatoms. The state of the marine environment is also the subject of Dr. Dzhenbekova's research, including investigating the presence of antibiotic resistance genes and metal resistance genes in metagenomic samples from the Black Sea and compiling a list of invasive and potentially invasive alien species in the Mediterranean and the Black Sea. The scientific and applied results of Dr. Dzhenbekova's research are related to the application of a set of modern methods for monitoring the marine environment, as well as

participation in the development of programs and strategic documents for the development of scientific research and innovation in the Black Sea, incl. updating the Strategic Program for Scientific Research and Innovation in the Black Sea. I have personal impressions of the research and laboratory activities of Dr. Dzembekova during the specialization and at the Agrobio-Institute - SSA. In his research activity Dr. Dzembekova is organized and responsible, demonstrates high scientific knowledge and laboratory skills and capacity to successfully conduct complex research. All this is the basis and prerequisite for the continuation and further development of her successful academic career after taking the academic position of 'associate professor'.

### **Conclusion**

After examining and analyzing the materials provided to me for the competition, I believe that the application, the previous experience, the results and the contributions of the scientific research activity of ch. assist. prof. Dr. Nina Stoycheva Dzembekova fit in perfectly and will significantly contribute to increasing the quality and efficiency of the overall scientific research, applied and organizational activities in the scientific section "Biology and Ecology of the Sea" and IO-BAS as a whole. Taking into account the above, I strongly recommend the honorable members of the Scientific Jury to vote and propose to the Scientific Council ch. assist. prof. Dr. Nina Stoycheva Dzembekova, to be elected as an "associate professor" in the field of higher education: 4. "Natural Sciences, Mathematics and Informatics"; professional direction: 4.3. "Biological Sciences"; scientific specialty "Ecology and preservation of ecosystems", scientific direction "Ecology and molecular taxonomy of marine organisms" at the Institute of Oceanology – BAS.

**Заличен на основание ЗЗЛД**

Sofia, 26.04.2024 г.

Prof. DSc  Iliev Atanasov