

REVIEW

on the materials submitted for participation in a competition for the academic position "Associate Professor" in the professional field 7 Healthcare and sport, scientific specialty "Medicine (Hygiene), announced in State Gazette issue 14 of 19.02.2021 for the needs of the National Center of Public Health and Analysis.

Reviewer: Prof. Dr. Irina Karadjova, Faculty of Chemistry and Pharmacy, Sofia University "St. Kliment Ohridski "

The only candidate in the competition is chief assistant, Dr. Vera Pavlova. The presented materials are in full compliance with the requirements of the Law for Development of the Academic Staff in Republic of Bulgaria and the Regulations for its application, the Regulations for the Terms and Conditions for Acquiring Scientific Degrees and Occupying Academic Positions at National Center of Public Health and Analysis.

Chief Assistant, Dr. Vera Pavlova graduated from the Faculty of Chemistry and Pharmacy (FHF) at Sofia University "St. Kliment Ohridski " as a Master of Chemistry, specialty "Applied Chemistry " in 1998.

1. Brief biographical data about the candidate

The scientific career of Chief Assistant Dr. Vera Pavlova began at the National Center for Public Health and Analyses, she was appointed as a chemist to the laboratory for chromatographic analysis. In the period 2003-2007 she has been a doctoral student at the National Center for Public Health and Analyses and successfully defended her PhD doctorate on the topic: "Hygienic and analytical aspects of the presence of microcystins in surface waters. In 2012 she was elected Assistant Professor, and since 2017 she is Head of the Chemical Factors Department, Directorate of the National Center for Public Health and Analyses. In 2013 she has acquired a specialty in Sanitary chemistry.

Her research activity is related to the application of chromatographic methods for analysis, for water quality control. Dr. Pavlova actively participates in the development and introduction of new analytical methods in the practice of an accredited laboratory "Laborex" at National Center for Public Health and Analyses. She is a participant in scientific and applied topics of the institute for assessment of new pollutants for drinking water, control of their concentrations and their distribution in drinking water sources. During this period she has an active teaching activity, participates in training courses for trainees and graduates on topics related to the application of chromatographic methods for analysis, protection of water purity, communal hygiene.

2. Description of the submitted materials

Chief Assistant Dr. Vera Pavlova has attached a list of scientific papers, presented for her participation in this competition. She is a co-author of a total of 25 publications, of which 11 are published in publications, referenced and indexed in world-famous databases of scientific information, and 6 are in journals with an impact factor; 14 articles have been published in non-refereed journals with scientific review or published in edited collective

volumes. The number of observed citations of scientific publications based on data from Scopus is 23. Chief Assist. Dr. Vera Pavlova is the first author in 11 of the 25 publications submitted for the competition. It should be emphasized that the research conducted is interdisciplinary and the contributions of the various authors are well outlined. There is no doubt about the leading role of Dr. Vera Pavlova both in the research conducted in the field of chemistry and in the chemical part of the publications.

The results of the research have been reported at 37 national and international scientific conferences.

Chief Assistant Dr. Vera Pavlova has serious project activity - she has participated as a team member and expert in 7 national projects at Sofia University "St. Kliment Ohridski "; she has been an expert in COST project, she has leaded national projects and scientific topics at National Center for Public Health and Analysis.

A detailed reference for the pedagogical activity of the candidate is also attached.

All submitted materials can be considered related to the topic of the competition. The candidate has attached a reference for the implementation of the minimum national requirements and the recommended criteria for holding the academic position "Associate Professor" in the Scientific Field 7. Health and Sports, Professional field 7.1. Medicine. The distribution by indicators is as follows: indicator A - 50 points; indicator B - 105.5 points (recommended 100); indicator D - 235 points (recommended 200); indicator D - 310 points (recommended 100) and indicator E - 210 points (recommended 100). It is evident that the data presented by Chief Assistant Dr. Vera Pavlova fulfill the requirements of Law for Development of the Academic Staff in Republic of Bulgaria, its regulations, and the Regulations on the terms and conditions for acquiring scientific degrees and holding academic positions at the National Center for Public Health and Analysis.

3. General characteristics of the candidate research activity and personal contribution. Scientific contributions

Scientific activity of Dr. Vera Pavlova is in the field of instrumental methods for analysis as methodological development and application, in the field of water as an interpretation of the obtained results and characterization of objects and processes. The main directions in which research has been conducted and scientific contributions have been achieved can be considered in three aspects:

- Development of new analytical methods, methodological update and adaptation of analytical methods.
- Interpretation of analytical results
- Characterization of different objects and obtaining new results for mechanisms and efficiency of processes.

Development of new analytical methods, methodological development and adaptation of analytical methods

Dr. Vera Pavlova initiated the first research in the country on cyanotoxins released by dangerous photosynthetic prokaryotes (cyanobacteria/cyanoprokaryotes). Analytical method for quantitative and selective determination of microcystines has been developed and introduced in analytical practice as a result of successful visits of Dr. Pavlova in well experienced laboratories abroad. Two variants of analytical procedures have been proposed

with application of HPLC-DAD or LC/MS as instrumental methods. The method developed is validated, the reliability of the results was confirmed using various instrumental techniques. Systematic studies have been performed on the types of leaching methods for quantitative extraction of microcystins from filtered biomass of cyanobacteria: extraction with suitable cartridges and extraction discs or extraction with an ultrasonic bath after a series of freezing and thawing of the biomass. Optimal variants were proposed depending on the number of samples and the purposes of the analysis, in accordance also with the possibilities for repeated use of the devices. In addition, an ELISA method for rapid screening for microcystins content in drinking water has been developed and applied in practice. Based on the developed method, a number of studies have been conducted for the influence of environmental factors on the concentration of microcystins in drinking water.

Ionic-chromatographic methodology for determination of bromates in drinking water (mineral, table and water samples from the water supply of the largest cities in Bulgaria - Sofia and Plovdiv) has been adapted and introduced in the analytical practice. The possibility for the formation of carcinogenic bromates under the conditions of drinking water disinfection is shown. The results, although below the maximum allowable limits, suggest strict control of the content of bromates in the water supply network.

The chromatographic method for determination of 12 polyaromatic hydrocarbons (PAHs) in water in combination with suitable extraction was adapted and introduced in the analytical practice - liquid/liquid and solid phase extraction were investigated and compared. Optimal variants are proposed and data for the content of PAHs in drinking water sources were obtained.

A method for the determination of triazines based on a new organic-inorganic hybrid copolymer for selective extraction and instrumental determination by HPLC has been developed. The results were compared with the use of commercial cartridges C18 - Oasis HLB and Cleanert PEP-2. The developed methodologies are applied for the characterization of surface waters.

4. Interpretation of analytical results.

Analytical methods developed for quantification of microcystins allowed additional research on the factors that influence the amount of microcystins, produced by different algae types. The relationship between the amount of microcystins, algal growth and chlorophyll content at different temperatures and light intensities is shown. Systematic chromatographic analysis showed the presence of unknown peaks with characteristics similar to the UV spectrum of microcystins, which are of interest for future research.

The development of an analytical methodology for the identification of microcystins leads to the development of phycological and ecological research on potentially toxic species and their hazardous substances. Using different methods, the main producers of microcystin and their contribution to the phytoplankton of shallow water bodies in Bulgaria are shown.

5. Characterization of different objects and obtaining new results for mechanisms and efficiency of different processes.

A series of field studies were conducted in 2004-2005, 2011, 2012-2014 and the first results for the characterization of the content of cyanotoxins in Bulgarian water bodies, used as drinking water sources were obtained. The presence of microcystins -RR and -YR was

identified in several water bodies. Microcystin-LA and nodularin were not detected. Water bodies with a high percentage of positive samples for the most toxic microcystin-LR are shown, suggesting that measures have to be taken in river basin management plans. The summary of the results of these studies for Bulgarian reservoirs, different in location, morphometry and trophic status, through the conducted multivariate analysis allows to outline the patterns of distribution of planktonic cyanoprokaryotic groups and the environmental factors that determine them. In recent years, drone aerial surveillance has been proposed and applied for the first time as an additional means of selecting sampling points during field research. A drone pilot study showed high levels of cyanobacteria and cyanotoxins: microcystins (MC-LR, MC-RR, MC-YR in Lake Durankulak and MC-LR and MC-RR in Blue River Dam), cylindrospermopsin (in Lake Vaya and Mandra Dam) and saxitoxins (in Lake Durankulak).

Scientific contributions can be characterized as new scientific results with very good practical application and potential for final realization.

6. Reflection in the literature

Chief Assistant Dr. Vera Pavlova presented a list of citations of publications with which she participated in the competition and the general conclusion is that the research she conducts and publishes has found an echo in the literature.

7. Teaching activity

The teaching and pedagogical employment of the chief assistant Dr. Vera Pavlova is significant and diverse. Since 2014 she has been an annual lecturer in the training programs organized at the National Center for public health and analyzes; main lecturer in courses for acquiring a specialty. She is supervisor of interns from the country and abroad, she led individual trainings in the field of chromatographic methods for analysis and quality control of pollutants in water. Dr. Pavlova was a supervisor of graduates from the Faculty of Chemistry and Pharmacy who successfully defended their master's theses.

7. Critical remarks

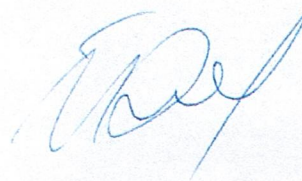
I have no general critical remarks on the research from the publications of Chief Assistant Dr. Vera Pavlova.

CONCLUSION

Chief Assistant Dr. Vera Pavlova participates in the competition with materials and activities that meet the requirements for holding the academic position of "Associate Professor" in ZRASRB, its regulations, and the Regulations on the terms and conditions for obtaining scientific degrees and holding academic positions in the National Center for public health and analyses in the professional field 7.1 "Medicine" scientific specialty "Hygiene". The presented documents show that she is a productive researcher in an interdisciplinary field, combining the development of instrumental methods and characterization of objects and processes. A review of the publications shows that after the initial inclusion in a working team, in a promising scientific field, she has managed to build her own view and her own original ideas for future research. I know personally the candidate and the team she works

with and I am convinced that even more serious achievements will be achieved in the field of water control in Bulgaria. The requirements for water quality are growing and trained researchers are needed, with high qualification, that can respond to the dynamics in the field. In this aspect, based on current and promising scientific topics, the quantity and quality of scientific papers, the response in the literature, scientific contributions, leadership and participation in research projects, as well as teaching activities, I strongly recommend the Scientific Council of National Center for public health and analyses to vote positively for the academic position "Associate Professor" in the field of higher education 7 Healthcare and Sport, professional field 7.1 "Medicine" scientific specialty "Hygiene" of Chief Assistant Dr. Vera Pavlova.

14.06.2021

A handwritten signature in blue ink, appearing to be 'V. Pavlova', is located to the right of the date.