OPINION

On the competition for the academic position of "Associate Professor" in the field of higher education 5. Technical Sciences, professional field 5.11 "Biotechnologies", scientific specialty "Technology of biologically active substances (incl. enzymes, hormones, proteins)", announced in the State Gazette, issue 70 of 20.08.2024.

Candidate: Senior Asst. Prof. Dr. Eng. Galina Dimitrova Yordanova

Prepared by: Prof. Dr. Katya Ivanova Valkova-Yorgova

1. General characteristics of the candidate's research and applied scientific activities

For participation in this competition, Senior Assistant Professor Dr. Eng. Galina Yordanova has attached a list of materials, including a total of 28 scientific papers, 1 monograph and 1 university textbook.

The presented autobiography and scientific papers show a deep interest and accumulated professional experience in various current problems of biotechnology and technologies of biologically active substances.

The candidate's scientific production shows that she fully meets the minimum national and university criteria for holding the academic position of "Associate Professor", as the total number of points in all groups of indicators exceeds the required minimum number of points. A total number of points of 709.03 were achieved, with which the candidate significantly exceeds the required minimum of 650 points.

The 28 scientific publications submitted for review, in 14 of which Senior Asst. Prof. Dr. Yordanova is the lead author, demonstrate her undeniable personal contribution to the preparation and publication of scientific works. In 10 of them she is the second author and in 4 of them – the third and subsequent co-author. Of the total number of scientific works, 7 publications have been printed in editions, referenced and indexed in world-renowned databases of scientific information Scopus, and 21 are publications in non-refereed journals with scientific review. All submitted publications convincingly demonstrate the candidate's ability to both initiate and successfully carry out scientific research activities.

It is noteworthy that the studies are aimed at solving important scientific challenges in modern biotechnology and the technology of biologically active substances such as enzymes, hormones, proteins and in terms of thematic plan they fully correspond to the current competition. It is also characteristic that the experimental work was carried out at a high scientific level, with the necessary theoretical depth and focus on the needs of the chemical and biotechnology industry. As a result, many of the developments provide specific solutions to certain problems related to quality improvement in enterprises of the chemical and biotechnology industry with a view to developing sustainable procedures and algorithms for quality management in chemical and microbiological laboratories. This is

confirmed by the fact that the results obtained from the research activity are oriented towards implementation in practice.

2. Assessment of the candidate's pedagogical training and activity

The provided reference shows that the candidate has gained significant pedagogical experience, which builds her as an established university lecturer. Senior Assistant Professor Dr. G. Yordanova is constantly engaged in conducting classes in various disciplines: in the Bachelor's Degree Program - Microbiology, Biotechnological Production, Biotechnology of Pharmaceutical and Agrobiological Agents, Technology of Milk and Dairy Products and Preservation, and in the Master's Degree Program - Microbiology, Food Legislation and Food Policy, Quality Management of Food Products and others. As an integral part of teaching, the candidate has an active participation in the development of curricula in the specified disciplines with an additional commitment to their annual update.

The knowledge and experience gained within the framework of 3 specialized training courses are of essential importance for the establishment of Senior Asst. Prof. Dr. G. Yordanova as an excellent specialist and lecturer, striving for new aspects of modern biotechnology and the technology of biologically active substances and their introduction into the curricula for the training of future specialists. The basis for this statement is given to me by the scientometric indicators, the certificates received and the presented monographic work and university textbook "Food Legislation and Food Policy".

Senior Asst. Prof. Yordanova speaks 2 foreign languages and under her leadership 10 graduates have successfully defended their theses.

Undoubtedly, the competence in the disciplines taught, as well as her significant contribution to the development and professional growth of young specialists - bachelors and masters, characterizes the candidate's erudition in the vast field of chemical and biotechnological science.

3. Main contributions

The main scientific, scientific-applied and applied contributions from the research activities of Senior Asst. Prof. Dr. G. Yordanova are in the field of modern biotechnology and the technology of biologically active substances.

The significance of the topic to which the habilitation work is dedicated - monograph: "Methods for improving quality in organizations of the chemical and biotechnological industry" is indisputable. Seeking answers to various scientific problems, Senior Asst. Prof. Yordanova summarizes the latest information and modern trends regarding the possibilities for developing and implementing procedures for incoming control of raw materials and materials in enterprises of chemical and biotechnological industry, procedures and algorithms for internal and external quality control in testing and

medical laboratories. It is clearly shown that a new type of research has already been established, which is in accordance with the new European directives for ensuring precision and determining the uncertainty of the results in tests on certain quality indicators of raw materials, materials and finished products.

In terms of the topic, the contributions correspond to the direction of the announced competition and can be systematized into 4 main groups:

• Research on the possibilities for biodegradation of phenol and phenol derivatives with immobilized cells of microorganisms on various carriers.

• Quality control and management in various productions and laboratories for analyzing food quality.

• Characterization and analysis of yeast - vitality and viability.

• Application of molds and yeasts for obtaining valuable bioproducts.

I highly appreciate the scientific contributions in the complex implementation of covalent immobilization and the determination of the optimal conditions for immobilization of strains Aspergillus awamori NRRL3112 and Trichosporon cutaneum R57 on polyamide granules. It has been established that with the combined action of the obtained immobilized systems it is possible to degrade up to 1.5 g•L-1 phenol, while individually immobilized and free cells do not have this capacity. The advantages of the two combined immobilized systems for biodegradation of phenol and phenol derivatives compared to the separate immobilized systems of the two strains and free cells have been proven.

In a series of publications, Senior Asst. Prof. Yordanova presents the results of research related to food quality analysis and control. The development and application of corrective actions in a laboratory for testing milk and dairy products, provides an algorithm for identifying and assessing the calibration range of a densitometer for milk and dairy products. A new analysis algorithm has been applied and corrective actions and procedures for application in a company for the production of meat and meat products have been revealed.

The prospects of applying new solutions for quality control of raw material supplies for the dairy industry have been scientifically substantiated. With their implementation in practice, a number of problems of a technological nature can be resolved, which will lead to a significant improvement in the quality of dairy products.

A new method has been created for predicting the controllability of the measurement process in a microbiological laboratory using a control chart of cumulative sums for the En criterion and the stepwise approximation method.

An important applied contribution is the developed automated cytometric method for determining the total number and viability of yeast cells using a newly synthesized DNA fluorescent dye PO-TEDM-1 and a new instrument Easycounter YC. The Easycounter YC system was used for determining of the total cell count and viability of Saccharomyces

carlsbergensis and the optimal linear interval was established: from 1 × 105 to 1 × 107 cells mL-1. The developed method is a useful and convenient tool for improving the control and monitoring of basic microbiological indicators and ensuring quality in bioprocessing of various samples.

The quality of baker's yeast Saccharomyces cerevisiae was studied and the storage stability of three different types of bread yeast was analyzed - fresh, dry and frozen. These results will contribute to a significant improvement in the quality control of baker's yeast and the production of bakery products.

It is with these scientific developments that the contribution of Senior Asst. Yordanova to the establishment of a new type of quality parameters, which are important to be studied and controlled in the production of food products, is clearly outlined.

An original scientific-applied and applied contribution is the use of molds and yeasts to obtain valuable bioproducts. The results obtained from these studies have an upgrading character in the creation of new strains of microorganisms producing large quantities of liquid and gaseous biofuels and with their implementation in practice a number of environmental problems can be solved. The possibilities for growing and developing two types of microorganisms Aspergillus oryzae and Saccharomyces cerevisiae on coffee grounds have been investigated, with the aim of utilizing coffee waste.

It has been proven that microorganisms are able to absorb coffee waste and convert it into useful organic products, such as bioethanol. A methodology for processing coffee grounds and obtaining an important bioproduct such as citric acid has been successfully applied.

The prospects of using coffee grounds as a component of the growth medium of the Aspergillus oryzae species, which produces the enzyme α-amylase, which is widely used in the food, pharmaceutical, medical, textile and chemical industries, have been scientifically substantiated.

The cultivation of microalgae or cyanobacteria is of fundamental and applied nature, which creates opportunities for the development of new technological models for biomass production, as well as ways to obtain biofuels.

4. Significance of contributions to science and practice

The presented scientific, scientific-applied and applied contributions of the research of Senior Asst. Prof. G. Yordanova are significant and are in the field of modern biotechnology and the technology of biologically active substances. Proof of her research merits, the quality and significance of the achieved results are the candidate's 15 open citations.

5. Critical remarks and recommendations

I have no critical remarks regarding the materials presented by Senior Asst. Prof. Dr. Galina Yordanova in the competition for the academic position of Associate Professor.

Conclusion

The overall scientific research and teaching activity of Senior Asst. Prof. Dr. Eng. Galina Dimitrova Yordanova convincingly demonstrates full compliance with the scientific field of higher education 5. Technical sciences and professional field 5.11 Biotechnologies, scientific specialty "Technology of biologically active substances (incl. enzymes, hormones, proteins)" of the announced competition. The candidate fulfills and even exceeds the requirements of the ZRASRB and the Regulations for its implementation and the additional requirements of the University "Prof. Dr. Asen Zlatarov" - Burgas for occupying the academic position of "Associate Professor".

The presented scientific, scientific-applied and applied production is sufficient in volume and proves the significance of her contributions in the scientific field of the announced competition. The analysis of the candidate's research and applied scientific activities proves that she is establishing herself as an active and consistent scientist, seeking original solutions for the development of biotechnology and technologies of biologically active substances.

The contributions of the scientific production are relevant and original, and have well-expressed theoretical and practical applicability.

In conclusion, I strongly suggest that the esteemed scientific jury and the members of the Faculty Council at the University "Prof. Dr. Asen Zlatarov" - Burgas evaluate the candidacy of Senior Assistant Professor Dr. Galina Dimitrova Yordanova and vote positively for her to occupy the scientific position of "Associate Professor" in the field of higher education 5. Technical Sciences, professional field 5.11. Biotechnologies, scientific specialty "Technology of biologically active substances (incl. enzymes, hormones, proteins)".

Date: 27.12.2024

Plovdiv

Member of the scientific jury:

(Prof. Dr. K. Valkova-Yorgova)