

OPINION

by Prof. Iskra Vitanova Ivanova,

member of the National Academy of Sciences according to the rector's order No. RD-21-332 of 15.02.2023

Regarding: competition for the occupation of the academic position "docent" in the field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological sciences (Microbiology – Microbial pathogenesis), announced in SG No. 92/18.11.2022

Only one candidate participated in the competition for "Docent": Ch. Mariana Ivanova Mrhova - Koseva, assistant professor

General description of the submitted materials for the competition.

The materials submitted by the only candidate ch. Associate Professor Mariana Ivanova Murhova – Koseva fully cover the requirements of the competition and present the specific evidentiary part, regarding the required criteria for the competition, as well as present the overall production of the candidate, both through lists of publications and citations, and through the text of the presented contributions, the curriculum vitae and etc. . The presented documentation is extremely well organized and very detailed, including digital copies of the publications related to the participation in this competition, as well as their summaries in Bulgarian and English. Those presented by Ch. assistant Mariana Ivanova Mrhova-Koseva scientific activities fully correspond to the minimum national requirements for PN 4. 3. Biological sciences.

A total of 35 scientific works were submitted for participation in the competition for the academic position of "Associate Professor" in the scientific specialty Microbiology - Microbial Pathogenesis, which were not used in the procedures for obtaining the educational and scientific degree "Doctor" and for the academic position of "Chief assistant".

The scientific works of Ch. Assistant Professor Mariana Ivanova Murhova – Koseva can be allocated in accordance with the criteria for the minimum national requirements of the RSARB and the Rules for it, as well as with the additional requirements of the BF, as follows:

Criterion "A" - an abstract of a dissertation work is presented for awarding the educational and scientific degree "doctor" - (50 points)

Criterion "B" - Habilitation work - monograph, which does not repeat those presented for the acquisition of the educational and scientific degree "doctor" and for the occupation of the academic position "chief assistant" (100 points)

Criterion "G" includes 15 publications in publications that are referenced and indexed in world-renowned databases of scientific information (Web of Science and Scopus), which are in categories Q2-Q4 (211 points).

15 publications in refereed publications without impact factor or impact rank; and 5 publications in peer-reviewed scientific conference proceedings;

Criteria "D" includes citations in scientific publications, monographs, collective volumes and patents, referenced and indexed in world-famous databases with scientific information (Web of Science and Scopus) (132 points)

Criterion "E" These indicators include: Supervision of a successfully defended doctoral student (25 points) Participation in a national scientific or educational project (75 points) Participation in an international scientific or educational project (20 points) Published university textbook or textbook that used in the school network (5.7 points) Published university teaching aid or teaching aid that is used in the school network (3.3 points)

Total number of points 617 with required 400 points.

Overview of the candidate's scientific and scientific-applied contributions

The contributions of the submitted materials for participation in the competition for the academic position of "associate professor" in a scientific specialty (Microbiology - Microbial pathogenesis) can be grouped into two main directions. The scientific works of Ch. Associate Professor Dr. Mrhova contain the scientific contributions to various fields and they are well differentiated. I agree with their wording in the presented reference. Below I will highlight those that I consider more important.

Contributions to the field of microbial pathogenesis

1. The conducted representative, large-scale and original study of the etiological structure of urogenital infections in outpatients in the territory of the city of Plovdiv is the first in the country and covers a 24-year period. In the presented monograph "Drug resistance and virulence in uropathogens from Enterobacterales. Research in the period 1997 - 2021" includes results of own research and summaries on uropathogens of the order Enterobacterales.
2. For the first time, a systematic evaluation of the drug sensitivity of a large number of isolates from samples of outpatients was carried out and an increasing resistance to fluoroquinolone preparations, a wide distribution of ESBL-producing strains, as well as those with multiple resistance, were found.
3. The presence of plasmid-mediated quinolone resistance has been demonstrated. Biofilm formation and serum resistance have been identified as significant factors in the adaptation of bacteria to the urinary tract.

4. An advanced experimental protocol was developed for the evaluation of serum resistance of Enterobacterales isolates, which could be proposed for use in clinical practice in the diagnosis of UTI.
5. Through correlation analysis of virulence characteristics and drug resistance of strains of *Candida* spp. from urethral and urogenital secretions, a lack of significant correlation between susceptibility to antifungal preparations and expressed virulence factors was found.

Contributions to the field of microbial ecology

1. For the first time in Bulgaria, the applicability of microbiological indicators as indicators of quality in ecological assessment of complex dams has been proven.
2. For the first time in the country, a metagenomic analysis of the structure of microbial communities was carried out by mass parallel sequencing of the gene encoding 16S rRNA in complex and economically significant dams.
3. For the first time, the ecological potential of economically significant dams has been determined, according to the information available in the Basin Directorates (DB) and the direct monitoring carried out in the water bodies' water area.
4. For the first time, spatial differences and physiological diversity of soil microbial communities in natural wetlands and constructed rice fields in the Maritsa river basin, protected under the Birds Directive 2009/147/EC as natural habitats, were investigated.
5. A perspective strain was selected - a producer of extracellular proteases from the species *Bacillus thuringiensis*.

Learning activity

Dr. Mrhova-Koseva gives lectures and exercises on the discipline "Microbial Pathogenesis" and lectures and exercises on the discipline "Microbial Genetics". The provision of the learning process in specific disciplines from the curricula of various specialties in the Bachelor's and Master's with textbooks and study aids provides students with access to modern knowledge and skills in these disciplines. In this regard, in the textbook "Biological Membranes" *Denev, I., Spasieva, St., Stefanova, D., Daskalova, E., Gevezova, M., Mrhova, M., Kostadinova, S. (2016). Biological membranes. Electronic edition, "Paisii Hilendarski" University Publishing House, ISBN 978-619-202-111-5.* presents and summarizes in three sections the modern knowledge of the structure and functions of biological membranes - biochemical composition, structure of biological membranes and features of membrane components; basic functions of membranes; specific membranes in the organismal world. The Guide to Microbiology *Kostadinova, S., Gochev, V., Mrhova, M., Girova, T., Georgiev, D., Iliev, I. (2017). Handbook of Microbiology. Paisii Hilendarski University Publishing House, ISBN 978-619-202-240-2.* is thematically consistent with the Microbiology curricula of students from various majors in the "Bachelor's" and "Master's" Colleges of the PU. The exercises are grouped thematically in such a way as to provide the necessary knowledge for

the relevant specialty. The manual provides knowledge and skills for classic techniques in microbiological laboratory practice, but also for basic modern molecular genetic methods widely used in microbiological research.

Critical remarks and recommendations

To those presented by Ch. Associate Professor Mrhova-Koseva materials I have no critical remarks. They correspond to the theme of the competition, both in terms of volume and quality. Summarizing everything said above, I can summarize that my assessment of the scientific research and teaching-teaching activities of ch. assistant Mariana Ivanova Mrhova - Koseva, is positive.

Conclusion

The documents and materials presented by Ch. Assistant Professor Mariana Ivanova Murhova – Koseva, meet all the requirements of the ZRASRB, the Regulations for the implementation of the ZRASRB and the additional requirements of the Faculty of Biology at Plovdiv University "Paisiy Hilendarski". The achieved scientific and scientific-applied contributions of Ch. assistant Dr. Mrhova-Koseva are at a high professional level, which is confirmed by the list of publications with her participation in journals in the international databases Scopus and WoS and citation of the results. . It is clear from the analysis that Ch. Associate Professor Mariana Ivanova Murhova – Koseva participated in the competition with a scientific production that, according to scientometric indicators, significantly exceeds the requirements for holding the academic position "Associate Professor": publications in journals with a high impact factor and citations in renowned international journals. Based on everything noted up to this point, I strongly recommend to the members of the honorable scientific jury, formed by the decision of the FS of the Faculty of Biology, to propose to the FS to award ch. Assistant Professor Mariana Ivanova Murhova - Koseva academic position "Docent" in professional direction 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences (Microbiology – Microbial Pathogenesis).

Sofia, 10.04.2023 г.

Prof. Iskra Ivanova.....