



OPINION

on the competition for an "associate professor" in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, professional field 6.2. Plant Protection, scientific specialty "Plant Protection", announced in the State Gazette No. 69 of 16.08.2024

Candidate: Chief Assistant Professor Dr. Mariana Krasimirova Petkova, Department of Microbiology and Environmental Biotechnologies at the Agricultural University, Plovdiv

Member of the Scientific jury: assoc. prof. Atanaska Stoeva, PhD, Agricultural University – Plovdiv, field of higher education: 6. Agricultural sciences and veterinary medicine, professional field: 6.2 Plant protection, scientific specialty "Plant protection", appointed as a member of the scientific jury by Order No РД-16-1186/22.10.2024 of the Rector of the Agricultural University

1. General data on the candidate's career

Mariana Krasimirova Petkova graduated from the Agricultural University of Plovdiv in 1997 and obtained a Master's degree in Agroengineering - Plant Protection. In 2002, she defended her dissertation on the topic: "Structure and function of new types of cytochrome P450 from higher plants" at the University of Kobe, Japan and obtained the educational and scientific degree "doctor" in the scientific specialty 01.06.04. Molecular Biology.

From 2003 to 2006, she worked as a post-doctoral fellow at the University of Osaka, Japan in the Department of "Protein Biochemistry". Since 2010, she has been an assistant professor, and since 2011, a chief assistant professor in the Department of "Genetics and Selection" at the Agricultural University of Plovdiv. From 2014 to the present, Dr. Mariana Petkova is a chief assistant professor in the Department of "Microbiology and Environmental Biotechnologies".

Dr. Petkova is fluent in two foreign languages, English and Russian, and has a good level of proficiency in Japanese and Italian. She periodically attends courses and conducts specializations in order to improve her qualifications in areas such as: application of modern analytical approaches to ensure the quality and safety of food, beverages and feed, functional study of proteins using BIACORE and crystallography, food traceability technologies based on DNA analysis, etc.

2. General description of the presented materials

In the competition for "associate professor" Mariana Petkova applied with a total output of 45 works, grouped as follows:

- Scientific publications on the nomenclature specialty - 45 issues, of which:
 - Publications related to the doctoral dissertation - 4 issues, which are not subject to consideration;
 - Publications with an impact factor – 18 issues (IF = 34,824; SJR = 7,615)
 - Publications in peer-reviewed and refereed scientific journals – 12 issues;
 - Publications in non-refereed journals – 11 issues.
- Scientific publications outside the nomenclature specialty – 1 issue.

For the preparation of the opinion, 41 issues are subject to analysis.

The personal participation of Dr. Mariana Petkova in the mentioned 41 works is illustrated by the fact that in one of the publications she is the sole author, in 17 of them she is the first author, in 9 she is the second author, and in the remaining 14 she is the third and subsequent author.

Regarding the bibliometric indicator for classifying scientific journals, three of the publications are in Q1 quartile journals (Horticulture, Scientia Horticulturae), seven and three

are publications in Q2 and Q3 quartiles respectively, and five are in the Q4 group.

The candidate fulfills the minimum number of points required by ZRASRB for occupying the academic position "associate professor" in the field of higher education 6. Agricultural sciences and veterinary medicine, professional field 6.2. Plant protection, with the total number of points from the mandatory indicators being 632,3 against the required 400. In two of the groups of indicators, the exceedance is significant.

3. Evaluation of the candidate's pedagogical activity

Chief Assistant Professor Dr. Mariana Petkova has 14 years of teaching experience at the Agricultural University. Since 2010, she has been an assistant professor, and since 2011, a chief assistant professor at the Department of "Genetics and Selection" at the Agricultural University, Plovdiv, where she teaches classes in "Genetics", "Molecular Genetics" and "DNA Recombinant Technologies". Since 2014, she has been a chief assistant professor at the Department of "Microbiology and Environmental Biotechnologies" at the Agricultural University, Plovdiv and teaches classes in Microbiology, Microbial PPPs in fruit growing, Molecular methods in plant protection.

For the period 2019-2024, the candidate's academic workload amounts to a total of 2097.3 hours, 22.6 hours of classes in a foreign language.

Dr. Petkova's teaching activities are complemented by the supervision of 8 successfully defended graduates from bachelor's and master's courses, one of the graduates was taught in English.

In the master's program Integrated Plant Protection, opened specifically for students who have completed a bachelor's degree in the professional field of Plant Protection and continue their studies in the same field, chief assist. prof. Dr. Mariana Petkova develops a curriculum and introduces the discipline "Molecular Methods in Plant Protection". Practical classes include isolation of DNA from microorganisms, plants and insects for the purpose of their identification and genotyping. The discipline expands the students' knowledge in the field of modern methods for detecting plant pathogens.

4. Research activity

Publication area

The research work of Chief Assistant Professor Dr. Mariana Petkova is focused on several areas:

- Metagenomics of soil and plant microbiome;
- Use of beneficial microorganisms as biostimulants in agriculture and biological agents for plant protection;
- Identification of plant pathogens;
- Application of next-generation sequencing to study the microbiome of various soils, sediments and compost for their use in agriculture.

Some of the more important scientific and applied scientific contributions of the candidate are related to:

- Isolation and characterization of soil microorganisms capable of degrading herbicides; 10 strains of bacteria and 3 strains of mold fungi with proven laccase activity, resistant to high doses of isoxaflutole, were selected, and collections of them were created;
- Study of the effect of gamma-irradiation on the composition of fatty acids and the sensitivity of oilseed rape to powdery mildew:

The changed composition of fatty acids of plants from the M1, M2 and M3

generation of individuals treated with a physical mutagen are associated with changes in biometric indicators and resistance to powdery mildew.

- Studies on the isolation and characterization of endophytic microorganisms and prospects for their application in organic agriculture;

Isolation and selection of endophytic microorganisms strains for their ability to endophytically colonize model plants from the Solanacea family and for their ability to suppress the development of phytopathogens;

Creation of a collection of strains of monophytic beneficial microorganisms for future applications in plant breeding;

Establishing the potential of the selected strains of monophytic beneficial microorganisms to influence the growth and development of plants for the purpose of their application as biofertilizers in agriculture;

Clarification of the genetic prerequisites for phosphatase, phytase, deaminase and indolepyruvate decarboxylase activities, and synthesis of siderophores;

Identification by application of molecular genetic methods of endophytic microorganisms that have passed screening for antimicrobial activity and synthesis of secondary metabolites.

- Molecular identification and biochemical characterization of entomopathogenic fungi of the genus *Beauveria*, proving their endophytic ability and the influence of selected isolates on phytopathogenic fungi and insects

Molecular identification of 23 isolates of entomopathogenic fungi of the genus *Beauveria*. Endophytic colonization of tobacco and stimulation of its growth and development after treatment with fungi of the genus *Beauveria* were established.

Insecticidal effect of strains *B. bassiana* 214, 644 and 733 against *T. viridissima* was established. The highest virulence of the tested fungi was shown by strain 644, followed by strains 214 and 733.

Citation and referencing of scientific production

The significance of the scientific research activity of Chief Assist. Prof. Dr. Mariana Petkova is confirmed by the significant number of citations of her works published in authoritative international journals, referred and indexed in Scopus and Web of Science, as well as by the high H-index (8) in Scopus. The list of citations of scientific publications includes 122 citations, 85 of which in journals with an impact factor, 35 in peer-reviewed journals without an impact factor and 2 articles are cited in doctoral topics. The total number of cited articles is 21, in 11 of which the candidate is the first author.

Participation in scientific projects

During the period 2014-2024 Dr. Mariana Petkova is the leader of one international project under the INTERREG Balkans-Mediterranean Transnational Cooperation Program and 3 internal projects funded by the Agricultural University. She is a participant in 3 internal, 3 international and 2 national projects.

5. Critical remarks and questions

I have no critical comments regarding the scientific papers submitted to me for review.

CONCLUSION

Based on the analysis of the pedagogical, scientific and scientific-applied activity of the candidate, I believe that assistant professor Dr. Mariana Krasimorova Petkova meets the requirements of the Law for the development of academic staff in the Republic of Bulgaria, Rules for implementation of the Law for the development of academic staff in the Republic of

Bulgaria and the Regulations of the Agricultural University for its application. The presented scientific works are of a noticeably high level, guarantee the acquired excellent qualification of Chief Assistant Professor Dr. Mariana Petkova for work in the professional field 6.2. Plant Protection, in which she directs her research work, and quantitatively cover and exceed the required indicators for the academic position of "associate professor".

All this gives me reason to **POSITIVELY** evaluate her overall activity.

I propose to the honorable Scientific Jury to also vote positively and the Faculty Council of the Faculty of Plant Protection and Agroecology at the Agricultural University - Plovdiv to elect chief assistant professor Dr. Mariana Krasimirova Petkova as an "associate professor" in the professional field of Plant protection, scientific specialty "Plant protection".

Date: 10.12.2024

Plovdiv

Member of the Scientific jury:

(Assoc. Prof. Atanaska Stoeva)