

OPINION

on the materials for participation in a competition for the academic position of "Associate Professor", Field of higher education 4. Natural Sciences, Mathematics and Informatics, Professional field 4.4. Earth sciences, scientific specialty "Ecology and protection of ecosystems", in the discipline "Microbiology", announced by the University of Forestry in SG no. 27 / 2.4.2021, procedure code FOR-AsP-0321-54.

Candidate for participation in the competition is:

Boyka Zdravkova Malcheva

The opinion is prepared by: Dr. Penka Angelova Moncheva, Professor in Professional field 4.3. Biological Sciences from Sofia University "St. Kliment Ohridski "

1. Brief biographical data about the candidate

Assistant Professor Boyka Malcheva was born in 1980. In 2003 she graduated with a Bachelor's degree in University of Forestry in Ecology and Environmental Protection, and in 2005 with a Master's degree in Ecology and Environmental Protection - settlement ecology. In 2004, after a two-year course of study at University of Forestry, she acquired a certificate of professional qualification "Teacher of general technical and special subjects". In 2012 he defended her PhD degree and acquired the educational and scientific degree "Doctor" in Ecology and Ecosystem Protection. The topic of her doctoral dissertation is in the field of soil microbiology. From 2012 until now, Dr. Boyka Malcheva has held consecutive academic positions "Assistant" and "Assistant Professor" at University of Forestry. Meanwhile, in the period 2010 - 2019 she worked as a chief expert-ecologist in the Sofia Regional Health Inspectorate. Her work experience at University of Forestry is 8 years and 6 months.

2.Conformity of the submitted documents and materials by the candidate with the required ones according to the Regulations for Development of the Academic Staff at University of Forestry

The presented documents and materials for participation in this competition for the academic position of "Associate Professor" are in full compliance with the requirements of the Regulations for Development of the Academic Staff at University of Forestry, Section IV Conditions and procedure for holding the academic position of "Associate Professor", Art. 60, items 4, 5 and 7.

3. Assessment of the teaching activity of the candidate

The teaching activity of Dr. Malcheva is in disciplines closely related to the topic of the competition for "Associate Professor". She leads practical classes in the discipline of Microbiology for three Bachelor's Degree Programs from 2012 to the present. During the 2019/2020 academic year, she also led the lecture course and participated in the updating of the curriculum of the same discipline. In the Master's degree Programs she teaches in two disciplines - Microbiological control in the environment

(for the specialty "Settlement Ecology") and Soil Microbiology (for the specialty "Forest Management"). Initially, she leads only practical classes, and from the academic year 2020/2021- the lecture course. She participated in the development of the topic "Practical training / research" of the curriculum of the discipline Microbiological control in the environment in connection with participation in the project "Development of a center for electronic forms of distance learning in University of Forestry", as well as in updating the curriculum of the discipline Soil microbiology and its development in English. Dr. Malcheva has published 4 textbooks - 3 on paper (of two of which she is the first author) and 1 in virtual libraries, of which she is the sole author.

She was the scientific supervisor of two successfully graduated students from TU-Varna.

3. Assessment of scientific, applied and publishing activity of the candidate

The reference for compliance with the minimal state requirements in accordance with Art. 2b of the Act for the Development of the Academic Staff in the Republic of Bulgaria for Field of higher education 4. Natural sciences, mathematics and informatics; professional field 4.4. Earth Sciences, indicates that the applicant research achievements fully fit the stipulated criteria, as follows:

- Indicators from group A: PhD dissertation - 50 p.
- Indicators from group B: monograph - 100 p.
- Indicators from group G: published book based on the PhD dissertation for the award of educational and scientific degree "Doctor" - 30 p.; 10 research articles in international peer-reviewed and indexed journals in the world-renowned databases of scientific information - 148 p.; 19 scientific publications in none-referred peer-reviewed journals - 143.1 points, ie. a total of 321.1 p. (minimum of 200 p.)
- Indicators from group D: 92 points (minimum of 35 p.)

A total of 31 publications are presented in the competition for the academic position of "Associated Professor" as follows - 1 monograph, 1 book and 29 research publications described above. Some of Dr. Malcheva's publications have been published in journals such as "*Catena*" (Q1, SJR- 1.389; IF 4.333), "*One Ecosystem*" (Q1, SJR 0.801), "*Journal of Environmental Protection and Ecology*" (Q3, SJR 0.214, IF 0.692) and "*Oxidation Coommunication*" (Q3, SJR 0.224). The total IF of the scientific papers submitted for participation in the competition is 5.025, SJR 2.841, Scopus h-index 1.

Dr. Malcheva has participated in the development of 8 scientific and applied tasks in the field of soil microbiology at the Technical University of Varna.

The results of the research activity were reported at 4 international and national scientific forums with posters.

4.1. Participation in scientific, applied and educational projects

Evidence of active research activities is the candidate's participation in 11 research and educational projects. Eight of the research projects are funded by various structures of University of Forestry; 2

- from TU-Varna, 1 national - from EFA - MAF. She has also participated in two educational projects
- in one as an expert in the training module "Soil Microbiology in a project with the financial support of the Operational Program "Human Resources Development " 2007-2013, co-financed by the European Social Fund and in another, as a specialist in the Operational Program "Science and Education for Smart Growth", co-financed by the European Union through the European Structural and Investment Funds.

4.2. Characteristics of the published scientific results

The results of the scientific activity of Dr. Malcheva, published in the scientific papers submitted for participation in the competition are in the field of soil microbiology and are mostly related to determining the microbiological and enzymatic status of different soil categories and substrates: urbogenic soils, presented in scientific papers G6, B3 and G8.1; agrogenic soils (G8.4, G8.6, G8.7, G8.11, G8.14, G8.15, G8.19); on reclaimed soils (G7.1, G7.2, D7.4); on forest soils after fire and fertilization (G8.17; G8.18); on polar soils (D7.3); on flooded soils (D8.2; D8.3); heavy metal polluted soils (A1; B3; G6; G8.1; G8.13); on soils affected by wind generators (publication G8.5); compost substrates and biochar during their development and application (G7.5, G7.6, G7.7, G7.9). In addition, microbiological and chemical methods for sanitary-microbiological control of food additives have been validated and verified (G7.8 and G7.10.).

4.3. Reflection of the candidate's scientific activity in the literature (citation)

The publications of Dr. Malcheva for participations in the competition for the academic position of "Associate Professor" have been cited 27 times, 81% of which by Bulgarian authors. 25% of the citations are in journals referenced and indexed in world-renowned databases of scientific information; approximately 63% in monographs and collective papers with scientific review; 11% in none-referred scientific journals. Twenty four of the candidate's scientific publications were cited. Twenty two of these articles (D10.2, D10.4, D11.1 – D11.17, D12.1 – D12.3) have been cited once predominantly by Bulgarian authors. Two publications - D10.1 and D10.3, have been cited 3 and 2 times, respectively, by both Bulgarian and foreign researchers.

4.4. Contributions in the works of the candidate (scientific, scientifically-applied, applied)

The candidate's research contributions are in the field of soil microbiology – mainly in microbiological and enzymatic status of different soil categories. I will summarize only some of them that I consider more significant.

- On the basis of research on the microbiological and enzymatic status of urbogenic soils, three groups of contributions could be distinguished - scientific, methodological and scientifically-applied. The main contributions, which I can assess as more significant from *the first group are*: The creation of a comprehensive assessment of the microbiological and enzymatic status of anthropogenic soils subjected to stress of different nature; Determination of microbiological and biochemical parameters

as indicators of exogenous impact on anthropogenic soils; Development of integrated coefficients for microbiological and enzymatic activity that can be applied to each soil type; Analyzing the relationships between individual chemical, physical, microbiological and enzymatic indicators, by applying appropriate statistical methods. *To the second group of contributions* I would like to emphasize: The modern methodological approach, which provides valuable information about the microbial biomass carbon and nitrogen; Plant species have been proposed to be used for soil reclamation in terms of biogenicity and biomass; Development of methods for complex determination of microbiological and enzymatic activity of urbogenic soils of different types. As *scientifically-applied* contributions I would point out: Development of microbiological and enzymatic indicators for rapid determination of the degree of pollution and biological status of soils in urban environments; Development of soil microbiological maps reflecting the relationship between the degree of soil contamination with heavy metals and the amount of total microflora.

- Valuable information was obtained on the influence of the type and concentration of fertilizer products in the dynamics during the vegetation period of the respective agricultural crop on: the content of elements important for soil fertility; the microbiological and enzymatic status of agr ogenic soils; biometric indicators of crops after fertilization. On this basis, indicator groups of microorganisms and enzymes related to soil fertility have been identified.

- As a contribution I would point out the development of statistical models based on scientific data, presenting synthesized criteria for assessing the informative value of certain diagnostic features in terms of the content of general microflora; A mathematical model based on regression and correlation analysis, analyzing the influence of four main factors on the abundance of the total soil microflora was created; A model for recognition and prediction of soil microbiological activity by indirect signs has been created.

5. Assessment of the personal contribution of the candidate

The position of Dr. Malcheva in the author's team of scientific publications submitted for participation in the competition shows that in 14 of the publications she is a leading author, in 4 she is in second place, and in the others she occupies a different position. She is the sole author of the monograph and the book based on a defended dissertation. This confirms her personal contribution to the experimental work, as well as to the preparation of collective and individual scientific papers.

6. Critical remarks and recommendations

I recommend Dr. Malcheva to activate the publication of the results of her research in international peer-reviewed and indexed scientific journals, thus providing wider access to them to the world scientific community. This will increase the citation rate of her works, which is an indication of their recognition. The experience gained as a participant in the work teams of various projects should stimulate her to implement projects under her guidance.

The presentation of the scientific contributions of Dr. Malcheva is too detailed and has a more character of description of results obtained. This makes the presented report insufficiently informative. Contributions must be distinguished from the results obtained and the approach in formulating the contributions must be at the same time analytical and generalizing.

7. Personal impressions

I do not know Dr. Malcheva personally, but as a member of the jury in the competition for academic position "Assistant Professor" in which she was the only candidate, I have a very good impression of her performance.

8. Conclusion

Based on the above analysis of the overall academic activity of Assistant Professor Malcheva, I could conclude that she meets all the criteria for holding the academic position of "Associate Professor". To participate in this competition, she has presented scientific papers, on the basis of which contributions have been defined. She has significant educational, scientific and project activities. My assessment of her overall academic activity is entirely positive. I propose to award the academic position of "Associate Professor" in the discipline of Microbiology in the professional field 4.4. Earth Sciences to Assistant Professor Dr. Boika Malcheva.

The opinion is prepared by:

(Prof. Dr. Penka Moncheva)

The opinion was submitted on: 09.08.2021.