



СЕЛСКОСТОПАНСКА АКАДЕМИЯ

ИНСТИТУТ ПО ПОЧВОЗНАНИЕ, АГРОТЕХНОЛОГИИ И ЗАЩИТА НА РАСТЕНИЯТА „НИКОЛА ПУШКАРОВ“

ул. Шосе Баня 7, София 1336, ПК 1369, тел.(359 2)8246141, факс(359 2)9059659, E-mail: soil@mail.bg, <http://www.issapp.org>

REVIEW

on the materials for participation in a contest 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 Assist. Prof. Dr. Boyka Zdravkova Malcheva;

Review Author: Irena Dimitrova Atanassova, Professor, DSc of Professional Field 6.1. Plant breeding, specialty "Soil Science" from ISSAPP "N. Pushkarov".

1. Brief biographical data about the candidate.

Assist. Prof. Dr. Boyka Malcheva graduated from University of Forestry (UF) in 2003, major in "Ecology and Environmental Protection", BSc in 2005 and major in "Settlement Ecology", MSc degree. In the period 2002-2004 she acquired the qualification "Teacher of general technical and special subjects". Since 2010 she has been working as a chief expert in the Sofia Regional Health Inspectorate, Department of Physico-Chemical Research of the Environment. In 2012 she obtained an educational and scientific degree "Doctor" in the field of "Soil Microbiology" and began working as an assistant at the University of Forestry - Department of Soil Science. The main scientific fields in her research are microbiological and enzymatic indicators of soils, qualitative, quantitative composition and activity of soil microorganisms in contaminated, burned and waterlogged soils, as well as on sanitary microbiology of food, water, soil, cosmetics, medicines, silage, compost, etc.

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

The candidate for the academic position "Associate Professor" meets Art. 59. (Amended and supplemented - University of Forestry 2018) and the respective minimum national requirements under Art. 2a, para. 2, 3 and 4.

3. Assessment of the teaching activity of the candidate

The candidate shows an enviable expertise in pedagogical activities, namely experience in teaching lectures and exercises to students in the disciplines: "Microbiology", "Microbiological control in the environment" and "Soil microbiology" and author of 1 curriculum. The candidate has also participated in the creation (equipment) of 1 training laboratory, as well as issued 4 textbooks,

of which 3 on paper and 1 in a virtual library.

4. Evaluation of the scientific, scientific-applied and publishing activity of the candidate.

The report on scientific, teaching and expert activity of the candidate shows that the candidate participates in the competition for associate professor with 31 publications out of 43, among which: in scientific journals with impact factor - 2; publications in journals, referenced and indexed in world databases with scientific information - 10; publications in unreferenced journals with scientific review or in edited collective papers - 19, publications in collections of scientific forums - 12 (2- national and 10 international); The candidate has 1 published book on the basis of a defended dissertation for the award of educational and scientific degree "Doctor".

4.1. Participation in scientific, applied and educational projects

The candidate has participated in 11 scientific, applied and educational projects, of which 1 international with a contribution in establishing the role of microbiological soil characteristics in various processes, humus accumulation, mineralization of soil organic matter, heavy metal pollution, fertilization with mineral and organic fertilizers and other soil reclamation agents.

4.2. Characteristics of the published scientific results.

The candidate publishes in the field of microbiological and enzymatic status of anthropogenic soils subjected to different loads of heavy metals with sources of automobile traffic and industry. The contributions in the scientific production of the candidate are in assessing the quantitative and qualitative characteristics of the microbocenosis of urban soils depending on some chemical indicators. Data on basic soil parameters and macronutrients, such as total carbon and nitrogen of microbial origin are presented. Detailed studies on soil enzymes of microbial origin, as well as on the influence of heavy metals on microbiological and biochemical parameters as the most sensitive indicators of exogenous impact in anthropogenic soils are presented. Interesting results are also presented on determining the biogenicity of urban soils under different vegetation, the influence of soil microorganisms on the mineralization of organic matter in anthropogenic environments.

An attempt has been made to present coefficients for microbiological and enzymatic activity that can be applied to any soil type. The candidate proposes and analyzes the relationships between individual chemical, physical, microbiological and enzymatic indicators, by applying appropriate statistical approaches and methods and well-interpreted complex data mainly from chemical and agrochemical soil analyzes. The research data represent a contribution to the study of urban soils, such as near road arteries and industrial sites. Modern methods have been used to determine microbial biomass carbon and nitrogen. Certain plant species have been proposed for future soil reclamation in terms of biogenicity and biomass results. A calculation method is applied to determine the rate of decomposition of organic matter in the studied urban soils. Modified methods for complex assessment of microbiological and enzymatic activity of urbogenic soils that can be used for other soil types are proposed.

Some publications present coefficients of microbiological and enzymatic activity that can be applied in determining the activity of soil microorganisms in soils exposed to different types of anthropogenic impact. Specific microbiological and enzymatic indicators for expressing the degree of contamination and microbiological status of urban soils are proposed. An innovative contribution of the candidate is the development of soil-microbiological maps, illustrating the relationship between soil contamination with heavy metals and the amount of total microflora.

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

According to the references submitted by the applicant for compliance of the scientific production with the minimum national requirements under Art. 2b of LDASRB and art. 2a, paragraph. 1 of RDAS in University of Forestry I accept as valid 25 citations from other authors, of which 7 in articles indexed in world databases with scientific information (Web of Science, Scopus) and 18 in publications outside the Web of Science and Scopus, which exceeds the required points in the corresponding group of the respective indicator.

4.4. Contributions in the scientific production of the candidate (scientific, science-applied, applied).

The main contributions of the candidate are expressed in the following: creation of a complex assessment of the microbiological and enzymatic status of anthropogenic soils subjected to different loads with heavy metals mainly from automobile traffic and industry; qualitative characteristics of the microbocenosis of urban soils depending on some chemical indicators; analysis of biomass carbon and nitrogen of microbial origin; study of soil enzymes of microbial origin; determination of the influence of heavy metals in soils on the studied microbiological and biochemical parameters; determination of microbiological and biochemical indicators for exogenous impact on anthropogenic soils - pigment bacteria, types of bacilli, enzyme activities; ratio of soil aerobic and anaerobic microorganisms in anthropogenic environment; fast-growing and slow-growing soil microorganisms in urban soils; using a complex methodological approach for characterization of urbogenic soils by analyzing soil, microbiological and biochemical indicators, assessing the interrelation between them.

5. Assessment of the personal contribution of the candidate

The main contribution of the candidate can be seen from the publications submitted for review, namely – 1st author in 7 publications in referenced and indexed in world databases and in 7 publications in non-refereed journals with scientific review or edited collective volumes and 2nd or next author in the rest of them.

6. Critical remarks and recommendations

I recommend the candidate to continue studies in the introduction and application of innovative methods for assessment of microbial communities in the context of their use as sensitive indicators of perturbations in the soil ecosystem under the influence of anthropogenic or other ecological impacts. I have no critical remarks.

7. Personal impressions

The candidate in the competition for "associate professor" is a promising scientist who has creative ideas and interests in applying new methods, thus giving her outstanding contribution to the development of soil microbiology in Bulgaria.

8. Conclusion

Based on assessment of teaching, scientific, science-applied and publishing activities of the candidate, participation in various scientific projects, and other scientometric indicators, I PROPOSE the candidate Assistant Professor Dr. Boyka Zdravkova Malcheva to acquire the academic position of "**Associate Professor**" in the discipline "Microbiology" from Professional Field 4.4. "Earth sciences".

Author of the review:



Prof. Irena Dimitrova Atanasova

The review was submitted on: 06.08.2021.