R E P O R T

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on the materials submitted for participation in the competition for the academic position **"professor"** announced in the Government newspaper no. 87/ 19.10.2021 for the needs of the Department of Ecology and Environmental Protection at the Faculty of Biology, **Sofia University "Kliment Ohridski"**

Higher education field **4. Natural sciences, mathematics and computer science professional direction 4.3. Biological sciences** (Ecology and conservation of ecosystems-Ecology of microorganisms)

I am included in the Scientific Jury for the election of "Professor" for the needs of the Department of "Ecology and Environmental Protection", Faculty of Biology (BF), Sofia University (SU) by an order of the Rector RD-38-611 / 15.12.2021. In the announced competition the only candidate is Dr. Anelia Evgenieva Kenarova, Associated Professor in the Department of Ecology and Environmental Protection, BF, SU. As a member of the Jury, I declare that I do not have common papers with the only candidate in the submitted list of publications.

Brief outline of the candidate's career

Dr. Kenarova graduated as a biotechnologist at the Biotechnology Center, SU at 1990, in 1996 successfully defended her dissertation for the scientific and educational degree "Doctor" in BF, SU. All her further career passes in this faculty through all stages of scientific development (specialist, assistant, chief assistant, associated professor). Since 2011 she hold the scientific position of "Associated Professor" in the scientific specialty "Ecology and Environmental Protection" at BF, Sofia University. Her career development is accompanied by holding a number of administrative positions as Deputy Dean of "Master" program; Head of the Department of Ecology and Environmental Protection at the Bulgarian Academy of Sciences - two mandates. As an expert she was assigned to

prepare reports for a number of organizations and companies such as the Ministry of Transport and Communications, the Ministry of Regional Development and Public Works, Nabucco Gas Pipeline - Bulgaria EOOD, South Stream Transport AD; Chevron - Bulgaria AD.

Description of the presented scientific papers and scientometric indicators

Requirements of the Law for the Development of the Academic Staff of the Republic of Bulgaria (ZRASRB)

All documents needed according to the Regulations of Sofia University for a participation in the competition were provided to me. The candidate participates in the competition for "professor" with 28 papers, different from those for Assoc. Prof. and Dr. A good impression creates the fact that 24 of them are in journals with impact factor or SJR, the others two are in proceedings of international conferences, printed in full text (11 pages each) and two chapters of books published by one international and one Bulgarian publishing house. Her works have found a place in a number of prestigious international journals with Q1 such as Ecotoxicology and Environmental Science, Environmental Science and Pollution Research, Polar Biology, Archaea (Table 1).

Table. 1. Minimal national criteria for the scientific degree "Associated Professor"

Group of criteria	Content	Required points for “professor”	**Assoc. Prof. Anelia Kenarova points**
A	Index 1	50	**50**
B	Index 2	-	**-**
C	Indexes 3 or 4	100	**102**
D	Sum of the indexes from 5 to 10	200	**289**
E	Index 11	100	**320**
F	Sum of the indexes from 12 to 18	150	**212.61**
Total sum		600	**973.61**

As can be seen from the results presented in Table 1, the points of the candidate in all criteria exceed those required by the Law on the Republic of Bulgaria for “professor”. The papers included in the criterion "C" according to ZRASRB includes five publications, two of which in journals with Q1, two with Q2 and one with Q4. Among the papers with

Impact Factor / SJR publications included in List “D”, two are in journals with Q1, five with Q2, five with Q3, and two with Q4. The number of citations found in Scopus (without self-citations of all authors) is 159, additionally different 5 in WoS, such a way the points in the criterion “E” are even more than indicated by the candidate. The collected 212.61 points on indicator "F" are from the scientific co-leading of one PhD thesis, participation and project management, and attracted funds for two of the projects led by Assoc. Prof. Kenarova. In the table the candidate includes only 11 projects, three international projects (including two under the EU Framework Program and one EEA) and 8 Bulgarian projects (she leaded three of them). They are implemented after the award of "Associated Professor". In fact, in her scientific career Assoc. Prof. Kenarova has participated in the implementation of 26 projects, leading 12 of them. The funds attracted from them are significantly more than those indicated in the table. The wide scientific interest of Dr. Kenarova is demonstrated by her participation in 31 conferences, 14 of which are international.

Additional requirements for "Professor" at Sofia University

The candidate meets the specific requirements reflected in the Regulations of Sofia University (Table 2).

Table 2. Additional criteria of Sofia University for "professor"

Scientific degree or academic position	***Professor***	***Assoc. Prof. Kenarova***
The educational and scientific degree “Doctor”	*yes*	***yes***
Helded position "Associate Professor"	*2(5)*	***11***
Annual teaching hours	*minimum 270 hours (equated to exercises)*	***lectures - 466 hours; total - 578 hours (average per year for the last five years)***
Annual lecture hours in the Bachelor's degree	At least 180	***246***
Teaching hours in mandatory disciplines	90	***366***

She has an educational and scientific degree "Doctor", the hold position of "Associated Professor" was for 11 years. The presented report on the annual study activity shows more than twice teaching hours than the required for the position. The extremely busy teaching program for the last five years includes both lectures (2330 hours) and exercises (558 hours) for educational degrees "Bachelor" and "Master". The great thematic

diversity of the disciplines in the field of microbial ecology and environmental protection is impressive. Along with the courses for full-time students, she also participates in the training of part-time students, as well as courses for non-specialists.

Main directions in the research work and the most important contributions

Assoc. Prof. A. Kenarova works in four main directions: 1, Influence of the soil contamination with radionuclides and heavy metals on the soil microbial communities (Bacteria and Archaea); 2, Effects of fungicides, in particular QuadrisR, on the soil bacterial communities; 3, Ecosystem functions and ecosystem services; 4, Bacterial communities of extreme ecosystems. She formulates a number of important scientific and applied scientific contributions in each of the areas, some of which are original. In my opinion, the most important among them are as follows:

Direction 1:

1. Decrease in the number of micro-organisms and the number of the presented taxa was observed after soil contamination with radionuclides and heavy metals.

2. Archaeal communities in areas contaminated with radionuclides and heavy metals are represented only by representatives of the order *Nitrososphaerales*, active participants in the transformation of nitrogen-containing compounds.

3. Pollution affects the functional diversity of communities, such as reduction in the number and type of the used carbon sources, prolonged lag phase, reduction in the activity of some catabolic enzymes like dehydrogenases and phosphatases.

Direction 2:

4. The negative effect of the fungicide Quadris^{R} on the activity of a number of soil enzymes has been proven. These enzymes can serve as bioindicators for the influence of this fungicide.

5. The use of Quadris^{R} resulted in antibiotic resistance of soil bacterial communities.

Direction 3:

6. Ecosystems (soil and aquatic) have been shown to have the capacity for a self-release by the petroleum hydrocarbons.

7. Methane-oxidizing bacterial strain was isolated. It can be used in bioremediation programs for a reduction of the methane emissions from old landfills.

Direction 4:

8. An ecological strategy for a rapid growth and a sharp change in the composition of bacterial communities in two of the Seven Rila Lakes has been observed. The temperature determines a domination of a small number of species that are best adapted to new environmental conditions.

9. Actinomycete strains isolated from Livingston Island have synthesized an antibiotic complex and can be used as producers of plant protection products.

CONCLUSION

Based on the materials presented in the competition and the analysis of their significance, I believe that the scientific and metric indicators of Assoc. Prof. Kenarova exceed the quantitative criteria for holding the academic position “professor" laid down in the Law on Academic Staff Development in Bulgaria and the Regulations to it, as well as the Additional Requirements of Sofia University. She is a prominent scientist with international recognition, publishing mainly in respected international journals. She has essential contributions in the field of ecology of microorganisms and microbial communities, the change of microbial communities after pollution with radionuclides, heavy metals and fungicides, the use of microorganisms and their enzymes as markers for pollution. Her scientific activity is accompanied by an active teaching and publishing. Her competence as an eco-expert has been used by a number of organizations and companies. Based on the above, I confidently support her candidacy and recommend to the scientific jury to propose to the Scientific Committee of Faculty of Biology, Sofia University "Kliment Ohridski" to choose Assoc. Prof. Kenarova as a "professor" in the professional field 4.3. Biological sciences, specialty Ecology and protection of ecosystems-Ecology of microorganisms.

January 10, 2022 Author of the opinion:

Sofia (Prof. M. Kambourova, DSc)