



STATEMENT

by **Assoc. Prof. Irina Schneider, PhD** - Department "General and Applied Hydrobiology",
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About: a contest for the academic position "Associate professor" in professional field 4.3. Biological sciences, scientific specialty „Ecology and ecosystems protection" (Ecology of the microorganisms) for the needs of Sofia University "St. Kliment Ohridski" published in PN №88/13.10.2020 **with the only candidate: Assist. Prof. Silvena Boteva Boteva, PhD**

1. Short biographic data and a characterization of the scientific achievements of the candidate

Assistant professor S. Boteva is a graduate of the Faculty of Biology to Sofia University "St. Kliment Ohridski". She subsequently graduates as a bachelor with the professional qualification ecologist in 2004, and in 2005 graduates with a master degree of an ecologist on environment protection. In 2011 she defends a dissertation thesis on the subject: "Structure and functions of the bacterioplankton in the system of the Seven Lakes – NP "Rila"" and acquires the ESD "Doctor" in the scientific specialty "Ecology and ecosystems protection". In the period 2009-2014 she works as an expert ecologist from which in the last four years to Scientific Research Department of the Technical University – Sofia. From February 2014 she is an assistant professor in Department "Ecology and environment protection" of the Faculty of Biology to Sofia University "St. Kliment Ohridski".

Assistant professor Boteva has presented 31 papers from which for the participation in the associate professor contest – 19 publication in editions that are refereed or indexed in world-famous databases with scientific information (Web of science or SCOPUS) and 2 publications as book chapters. Additionally, there are presented 3 publications that are in non-refereed and non-indexed editions that support the contributing character of the papers. For the contest the candidate has presented 34 participations in international and national forums (25 of them are in international forums) as there is a technical mistake in the numeration of the conference participations. All of the articles represented in the contest are in a co-authorship as in more than 67% of them the candidate is first or second author. The scientific parameters are: total IF = 16.541 and the Hirsch index according to Scopus is 4. From presented 131 citations (one was excluded due to hidden self-citation), 93 of them are in scientific journals, scientific editions, monographs and patents, refereed and indexed in world-famous databases of scientific information (Web of Science and SCOPUS).

The points of the scientific papers of the candidate for the contest are:

- **Indicators of A:** dissertation thesis - 50 p.
- **Indicators of group B:** habilitation paper – scientific publications in editions that are refereed and indexed in world-famous bases with scientific information (Web of science or SCOPUS): publications in Q1 – 50 p.; publications in Q2 – 60 p. Total: 110 p.

- **Indicators of group C:** publications in Q2 – 140 p.; publications in Q3 – 15 p.; publications in Q4 – 24 p.; publications in editions with SJR without IF – 40 p.; book chapters – 30 p. Total: 249 p.
- **Indicators of group D:** cited papers – 186 p.

In the period 2005-2020 Doctor Boteva participates in 13 projects of FSS to Sofia University “St. Kliment Ohridski” on 3 of which she is a coordinator. Other projects are financed by FSS to Bulgarian Ministry of Science and Education, Interreg V-B „Balkans – the Mediterranean“, program BG03 „Biological diversity and ecosystems“. Together with colleagues from the Scientific research laboratory “Ecological technologies and management” to the Technical University – Sofia doctor Boteva has participated in more than 24 elaborations as an expert ecologist some of which are for the elaboration of compatibility assessments and assessment reports for the impact on the environment. It could be seen that Dr. Boteva **constantly upgrades the knowledge, the skills and the professional competences, works with various scientific partners including international ones and established herself as an expert ecologist.**

The presented by the candidate documentation is clear, well-structured **and complies to the requirements of the Law for the development of the academic staff in the Republic of Bulgaria and the Regulation for its application as well as the Regulation for the development of the academic staff of Sofia University “St. Kliment Ohridski”.**

2. Assessment of the teaching activity of the candidate

The entire assessment of Assist. Prof. Silvena Boteva as a candidate for the academic position “Associate professor” would not be completed without her teaching activity. The academic reference shows that in the last 3 academic years Dr. Boteva has an overtime activity as the average contact classes activity is 447 hours and the total activity is 569 hours. The candidate is an author and co-author of the educational programs of the compulsory disciplines for Bachelor Degree: “Waste management”, “Pedology”; “Assessment the impact on the environment”; on the elective disciplines “Ecological imprint” for Bachelor Degree and “Mapping and assessment of the ecosystem services”; “Alternative energy sources” in Master Degree. Dr. Boteva is a guest lecturer also in other universities as she has elaborated the scientific program of the compulsory discipline “Procedures for assessment of the impact on the environment and environmental permits” and leads the lectures and the exercises for the students from Master Degree program “Engineering ecology” in the Technical University - Sofia. In the courses are presented the procedures for assessment of the impact on the environment of the investment proposals, the new theoretical formulations and concepts for the assessment of the ecological imprint are implemented; the contemporary tendencies in the biological diversity protection and sustainable consumption of the ecosystem services. By the represented information it is seen that **the candidate constantly modernizes the educational content in the leading disciplines according to the new law requirements and achievements of the science in this field.**

Doctor Boteva participates in the practical education of the students in **Bachelor Degree** in the compulsory disciplines “Ecology and environment protection”; “Summer educational practice on ecology”; “Waste management”; “Ecological monitoring” and “Pedology”, and in the lectures on the disciplines “Assessment of the impact on the environment”; “Pedology” and “Ecological imprint”. In **Master Degree** she leads the lectures on “Mapping and assessment of the ecosystem services” in Master Degree Program “Ecology”; “Alternative energy sources” in

Master Degree Program “Bio-business and bio-entrepreneurship”; “Procedures for assessment of the impact on the environment and environmental permits” in Master Degree Program “Engineering ecology”; “Pedology” in Master Degree Program “Ecotourism”. She participates in the practical education of the master students in the disciplines: “Ecology of the microorganisms”, “Mapping and assessment of the ecosystem services”, “Alternative energy sources” and “Procedures for assessment of the impact on the environment and environmental permits”, etc.

In the period 2014-2020 Dr. Boteva is a scientific advisor of 11 successfully graduated students from the Master Degree Programs “Ecology”; “Environment protection”; Microbiology and microbiological control”. Eight of the graduating students are from Technical University – Sofia.

3. Assessment of the scientific contributions

Doctor Boteva develops her professional experience in the field of the ecology **as her main scientific contributions are in the field of the ecology of the microorganisms**. In her studies Dr. Boteva applies classical methods combined with contemporary molecular-genetic methods and remote methods with an appliance in the ecology. **Her studies and contributions are related to:**

- **assessment of the impact of the pollutants on the soil microbial communities** – it has been found the impact of the fungicide azoxystrobin, the heavy metals, the petroleum products and radionuclides on the environmental microorganisms. It has been found out that the fungicide azoxystrobin stimulates the development of antibiotic resistance of the soil microflora. It has been analyzed the dehydrogenase and phosphatase activity of microbial communities on lands, polluted with radionuclides and heavy metals. It has been defined the microbial abundance in soils polluted with heavy metals through the application of quantitative PCR (qPCR). It has been analyzed the relationship between the abiotic and biotic properties of the soil heavy metal pollution gradient and it has been determined an inversely proportional dependence between the dehydrogenase activity and heavy metals concentration. This group of contributions is presented in the larger part of the presented scientific publications for the contest.
- **analysis of the microflora of the high-mountain lakes** – it has been found out that the microbial number increases 81 times from July to September 2006. Molecular methods have been used for the analysis of the bacterioplankton diversity in the lakes Bubreka and Okoto. Three clone libraries of the analyzed samples from the Okoto Lake have been built.
- **studies in the field of the ecotoxicology** – new indicators for risk ecosystem condition assessment have been analyzed. The PCR analyses in the assessment of the impact of the herbicides paraquat and glyphosate on test objects *Lepidium sativum* L. and *Raphanus sativus* var. *radiculata* L. register mutational rearrangement in the plant’s DNA. It has been studied the opportunity for the usage of *Lepidium sativum* L. as a test object for soil monitoring in the analysis of samples from the stations of the National system for environment monitoring. Strong correlations have been found between the germination of the seeds and the germs development and the change in the content of nitrogen and the concentration of cobalt, nickel, zinc and copper in the soil samples. Studying the ecotoxicity of the purified wastewater from a metal products production on *Pseudorasbora parva* and *Lepidium sativum* L., it has been registered almost a 100% mortality of the pay-finned fish although the parameters are in norm.

- **application of remote methods in the field of the ecology** – two methods (based on pixels and based on objects) have been analyzed for the classification of the land coverage and land usage in the processing of the satellite images. It has been assessed the surface distribution of different types of slopes as it has been studied the relationship between the geomorphology and the types of land coverage through the application of digital model of altitude. It has been applied a method for the risk assessment of erosion in the region of Bregalnitsa River and National park Marovo – Republic of Northern Macedonia. It has been determined the combined impact of the environmental factors on the vegetation through the application of a digital model for altitude. It has been compared the Canadian system for assessment the danger of forest fires and the National system for forest fires risk assessment in the Mediterranean region (Crete island, Greece) through the application of separate modules for vegetative species.

Beside the presented contributions upper in the text, another important contribution of Dr. Boteva is the research of the opportunities for textile waste utilization with the elaboration of an ecological adsorbent for application in petroleum floods.

4. Critical notes and recommendations

My recommendation to the Associate professor candidate is in the future to reconsider the applicable value of the scientific publications and to have the courage for projects developments on which to be a leading partner and a coordinator.

5. Personal impressions of the candidate

I have known Dr. Boteva since she has started working in the Faculty of Biology. My personal impression is that during this time **she has developed herself as a lecturer and a scientist with a rich professional experience. She works well in a team and is a desired partner in the scientific researching activity.** Dr. Boteva is engaged as well in the administrative activity of the Faculty of Biology to Sofia University “St. Kliment Ohridski” as she is a member of the Counsel of the specialties of Molecular biology, Biotechnologies and Agrobiotechnologies and she is in the working group for the specialty Agrobiotechnologies. At the moment she is a secretary of the Master Degree Program “Environment protection”.

6. Conclusion

Based on everything described upper in the text about the teaching, researching experience and the contribution of Assist. Prof. Silvena Boteva my assessment definitively is positive and high. The report for the execution of the minimal national requirements shows that she has 595 points from the required 400 minimal for the position “Associate professor” in the professional field 4.3. Biological sciences, scientific specialty Ecology (Ecology of the microorganisms). All of that gives me the reason to recommend with conviction to the honored Scientific jury as well as to the Scientific council of the Faculty of Biology to Sofia University “St. Kliment Ohridski” to confer Assist. Prof. Silvena Boteva, PhD the academic position “Associate professor”.

01 February, 2021

Assoc. Prof. Irina Schneider, PhD