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Opinion

by Prof. Dr. Paraskeva Michailova

In connection with a competition for the academic position of "Professor", announced in the State Gazette No. 45 of 03.06.2025, in the field of higher education: "4. Natural Sciences, Mathematics and Informatics"; Professional field: "4.3. Biological Sciences";

By order No. 70/01.08, 2025 of the Director of IBEI- BAS, I have been selected as a member of the Scientific Jury in a competition for the academic position of "Professor" in the scientific specialty "Ecology and Ecosystem Protection" for the needs of the "Biomonitoring and Ecological Risk" section of the "Ecosystem Research, Ecological Risk and Conservation Biology" department of IBER- BAS.

The competition was attended by a single candidate, Assoc. Prof. Dr. Mihaela Nikolova Nedyalkova from IBER, BAS. In 1989, the candidate graduated from the Faculty of Biology of Sofia University "St. Kliment Ohridski", with a Master's degree in Biology with a specialization in Ecology. In 2006, she received the educational and scientific degree "Doctor", successfully defending a dissertation in the field of ecology and ecosystem protection, entitled "Dynamics in the composition of food and energy needs of house mice *Mus spicilegus* (Petenyyi, 1882) and *Mus musculus musculus* (Linnaeus, 1758) under conditions of syntropy". During the period 1990-1994 she worked at the Institute of Zoology, and from 2017 to the present day she is at IBER. From 2018 to the present day, she is the head of the department "Ecosystem Research, Ecological Risk and Conservation Biology". She is a Deputy Director of IBER since 2021. She has a total work experience in the field of ecology: 35 years and 6 months. Her main direction of scientific research is ecotoxicology and physiological ecology. She successfully develops problems of detoxification of the animals under the influence of various anthropogenic pollutants. A direction of great importance for reducing a number of physiological damages caused by anthropogenic pollutants, which helps to maintain population homeostasis in the affected ecosystems. Oxidative stress in laboratory white mice caused by intoxication with lead and cadmium and their combination was analyzed. A strong increase in the values of the non-enzymatic antioxidant glutathione and a decrease in the levels of malondialdehyde were found (scientific papers 1, 8). The influence of natural zeolite (clinoptilolite) on small rodents was monitored and a lack of toxicity and its positive impact on the physiological state of animals was found (scientific papers 6, 21). By applying a complex of different methodological approaches, the detoxifying effect of zeolite has been proven (scientific paper 1), a development

with an important original contribution to ecotoxicology. The toxic effect of Pb and Cd on blood cells of laboratory mice has also been monitored and a significant decrease in granulocytes has been reported (scientific paper 5).

The candidate's research on the biological response of indicator species of small mammals to exposure to ionizing and non-ionizing radiation in the environment is interesting. Using a cytogenetic approach, changes in the formation of micronuclei in white blood cells of small mammals depending on exposure to UV radiation have been traced (scientific papers 3, 26). The study represents a new, original approach to monitoring the impact of radiation on living organisms. The change in β-activity in populations of small rodents depending on altitude in the Rila Mountains was monitored. This study points out the significance of the β-activity indicator, as well as the importance of small rodents as indicators for radiological monitoring in the conditions of high-mountain ecosystems (scientific papers 7, 9, 20, 24). The genotoxic effect of low-frequency electromagnetic radiation has been experimentally monitored through a micronucleus test in bone marrow cells of small rodents (scientific papers 2, 17, 18). Significantly, with a great practical focus, is the candidate's research on the protective effect of the biologically active substance resveratrol, the use of which ensures the prevention of significant genetic damage (scientific papers 15, 19).

In addition to her work in the field of ecotoxicology, the candidate also addresses issues related to the role of small mammals in the transmission of zoonotic diseases. The circulation of *Lyssavirus* viruses in cave bats in Vietnam was monitored (scientific paper 10). Studies have also been conducted on the gut microbiome of the rusty wood vole (*Myodes glareolus*) and the common wood mouse (*Sylvaemus sylvaticus*) from the area of the village of Beli Iskar, Rila Mountain. This analysis has great practical value and indicates that small rodents are not vectors of African swine fever virus (ASFV) (scientific paper 14). The candidate also has original faunal studies on the vertebrate species found on Tsibar Island and the Ibisha Reserve in the Danube River. Traces of the invasive species, the raccoon dog (*Nictereutes procionoides*) have been identified (scientific paper 11).

Research by the candidate, conducted at different altitudes in the Lozen and Rila Mountains, shows a relationship between the number of small rodents and habitat conditions (scientific papers 4, 25).

The candidate's scientific papers are total 82, with publications in international journals prevailing. In this competition she participated with 26 publications, all of which have already been published, most in journals with Impact Factor as Toxics, Veterinary Sciences, Acta Proptozoology, Acta Zool. Bulgarica ets. with a total impact factor 18,237. She also

participated as a co-author in a total of 3 book chapters and a monographic paper. Five other papers were also presented outside the competition. Her papers have received wide acclaim among our and foreign scientific communities. A total of 136 citations are presented, most of them in journals with an impact factor, such as Diversity, Science of the Total Environment, Environment Monitoring and Assessment etc. The candidate also has significant scientific and organizational activity. She has participated in 12 national scientific projects and in international one, also she is the leader of 1 national scientific project. She has participated in many international and national forums with reports in the field of ecotoxicology. With her knowledge and skills, she contributes to the development of young specialists in the field of ecotoxicology, an important field for our time. She was the co-supervisor of a doctoral student who successfully defended his dissertation in the field of ecotoxicology in 2019. Dr. Nedyalkova has attracted funds from projects a total of 170,000 BGN, and for the Base Organization, IBER, they are 116,000 BGN. The presented report on indicators A, B, D, G, E, expressed through a point system is 959, exceeding the national minimum scientific requirements.

Conclusion: The scientific research activity of Assoc. Prof. Dr. Mihaela Nedyalkova fully meets the requirements for holding the academic position of "Professor" specified in the Act on the Development of Academic Staff in the Republic of Bulgaria and the Regulations for its Implementation. With full conviction, I propose to the Scientific Jury to award Assoc. Prof. Dr. Mihaela Nedyalkova the academic title of "Professor" in the scientific specialty "Ecology and Ecosystem Protection".

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Prepared the opinion:
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