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Review from Assoc. Prof. Margarita Topashka-Ancheva, PhD, Member of the Scientific Jury, appointed by order No.70/01.08.2025. Based on Art. 4 and Art. 25 of the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), Art. 57 of the Regulation for the Application of the LDASRB, Art. 11, Para. 4 of the Regulation on the Conditions and Procedure for Acquiring Scientific Degrees and Holding Academic Positions at the Bulgarian Academy of Sciences (BAS), Art. 13, Para. 2, item 25 of the Regulation on the Conditions and Procedure for Acquiring Scientific Degrees and Holding Academic Positions at the Institute of Biodiversity and Ecosystem Research, BAS (IBER-BAS), Decision of the Scientific Council of IBER-BAS (Protocol No. 45/18.07.2025, item 6) and a public announcement in the State Gazette, issue No. 45/3.06.2025, for the professional field "4.3. Biological Sciences," scientific specialty "Ecology and Ecosystem Conservation (02.22.01)." for the needs of the "Biomonitoring and Ecological Risk" section within the "Ecosystem Research, Ecological Risk, and Conservation Biology" department of IBER-BAS.

1. General Overview of the Materials Received

One candidate has applied for the professor position in the scientific specialty "Ecology and Ecosystem Conservation" - Assoc. Prof. Mihaela Nikolova Nedyalkova, PhD. The set of materials presented by the candidate is in accordance with the Regulations for the Development of Academic Staff at the Institute of Biodiversity and Ecosystem Research, BAS. I accept that Mihaela Nikolova Nedyalkova and Mihaela Nikolova Beltcheva, as she is listed in most of the submitted materials, are one and the same person.

2. Biographical Data

Assoc. Prof. Mihaela Nedyalkova graduated from Sofia University "St. Kliment Ohridski" with a master's degree in biology, specializing in ecology. From 1990 to 1994, she was a full-time PhD student at the Institute of Zoology, BAS. She successfully defended her dissertation on the topic "Dynamics in the Composition of Food and Energy Needs of the House Mice *Mus spicilegus Petenyi, 1882* and *Mus musculus musculus (Linnaeus, 1758)* in a Sympatric Area." Since 2006, she has been a Senior Assistant Professor, and since 2017, after a successful competition, she was elected as an Associate Professor.

Mihaela Nikolova's total work experience at the Institute of Zoology and its successor IBER, BAS, is more than 35 years and 6 months. Currently, she is an Associate Professor in the "Biomonitoring and Ecological Risk" section, Head of the "Ecosystem Research, Ecological Risk, and Conservation Biology" department, and Deputy Director of IBER-BAS.

3. Assessment of the Candidate's Scientific and Scientific-Applied Activities

In this competition for professor, Assoc. Prof. Mihaela Nedyalkova has a substantial body of work, including 26 scientific articles, co-authorship in chapters of three scientific books, and full texts and short communications from scientific forums in Bulgaria and abroad. Nine of the listed publications are in group B4 - outside the habilitation thesis. They are presented in the habilitation work group. The total points for group B indicators are 142. There are 17 scientific publications in journals that are referenced and indexed in globally recognized databases of scientific information (Web of Science and Scopus), outside the habilitation work, two of which

are ranked Q1 and Q2. The candidate is also a co-author of three book chapters. The total number of points for group G indicators is 287.

The results of the candidate's research work have resonated in the scientific community, and she has received 136 citations in scientific journals, monographs, collective volumes, and patents, referenced and indexed in globally recognized databases of scientific information (Web of Science and Scopus), which earn the candidate 272 points. It is noteworthy that her publications are cited in articles published in prestigious scientific journals. A publication (*Beltcheva et al, Biological Trace Element Research, 147, 1-3, Springer, 2012*), in which the candidate is the first author, has been cited 21 times and continues to be cited in scientific articles published in 2025. Assoc. Prof. Nedyalkova has been an official consultant for a successfully defended PhD student in the field of ecotoxicology.

She has actively participated in 13 national scientific projects, leading one of them. In total, under section E, Assoc. Prof. Nedyalkova has accumulated 208 points.

The total points for group indicators A+B+G+D+E are 959, which exceeds the requirements for being awarded the academic title of "professor."

The candidate has actively participated in scientific events in Bulgaria and abroad with oral and poster presentations.

The main part of the publications related to the topic of the competition are in the field of physiological ecology and ecotoxicology.

4. Scientific and Scientific-Applied Contributions of the Candidate - Assoc. Prof. Mihaela Nedyalkova

The contributions of Assoc. Prof. Mihaela Nedyalkova can be summarized in four main areas, as follows:

4.1. Ecotoxicological Studies with a Focus on Organism Detoxification

Regardless of the expansion and deepening of research on the effects of heavy metals and toxic elements, primarily of anthropogenic origin, and the serious regulatory measures introduced to limit their spread, the issue of their effective elimination from both organisms and ecosystems remains a focus for researchers. Based on these considerations, Assoc. Prof. Nedyalkova has focused her scientific research on identifying and applying effective detoxification strategies that would reduce physiological damage caused by pollution and help maintain population equilibrium in affected ecosystems in the long term.

The scientific contributions of Assoc. Prof. Mihaela Nedyalkova, contained in the publications submitted for this competition, can be summarized as follows:

- In laboratory experiments on subchronic intoxication with lead, cadmium, and their combination in the kidney and liver cells of laboratory white mice, Assoc. Prof. Nedyalkova obtained original results with a fundamental contribution to ecotoxicology, related to the assessment of oxidative stress induced by the applied heavy metals. She noted the highest lipid peroxidation in the kidneys after exposure to cadmium, which confirms its strongly pronounced nephrotoxic effect. In the case of treatment with lead and a combination of lead and cadmium, a significant increase in the levels of the non-enzymatic antioxidant glutathione (GSH) was observed. The results allowed her to draw

the important conclusion that the increase in GSH and the decrease in MDA levels are due to the activation of cellular compensatory mechanisms, related to the overexpression of antioxidant systems in the cells (publications No. 1 and No. 8).

- An original scientific-applied contribution to ecotoxicology and strategies for reducing the toxic effects of subchronic heavy metal exposure is the candidate's finding that in animals with chronic intoxication, the application of zeolite significantly reduces the accumulation of cadmium, which shows the potential of zeolite as an effective natural enterosorbent (publication No. 1).
- A significant contribution to the study of the toxic effects of lead and cadmium is the immunotoxic effect of these metals established by Assoc. Prof. Nedyalkova, specifically the disruption of leukopoiesis kinetics. The application of clinoptilolite as a food supplement did not lead to a significant correction of the studied indicators, which suggests a limited effect of the mineral on leukopoiesis and the cellular immune response (publication No. 5).

4.2. Biological Response of the Organism to the Effects of Ionizing and Non-Ionizing Radiation in the Environment

- In this area of Assoc. Prof. Nedyalkova's research, the most significant contributions consist of obtaining new data on the biological response of the organism to the effects of ionizing and non-ionizing radiation in the environment depending on the dose and duration of exposure.

The research in this field has a significant contribution to drawing attention to the non-target and combined effects of UV radiation (publications No. 3 and No. 26).

- New, original data were obtained regarding the genotoxic effect induced by prolonged exposure to low-frequency electromagnetic radiation (publications No. 2, 17, and 18). The radioprotective effect of the biologically active substance Resveratrol was established, which suppresses the appearance of induced genetic damage. The research was expanded with an analysis using an extract from *Mangifera indica*, known for its antioxidant properties.

On a new experimental model - bone marrow cells of rodents - the powerful radioprotective properties of Resveratrol were proven, and these results open up new possibilities for its application in the prevention of genetic damage resulting from chronic electromagnetic exposure (publications No. 15 and 19).

4.3. The Role of Small Mammals in the Transmission of Zoonotic Diseases

In recent years, Assoc. Prof. Nedyalkova, using her extensive knowledge of small mammals, has expanded her research profile by focusing on their role in the transmission of zoonotic diseases. In this field, she also has her scientific contributions. IgG-immunoreactivity to the rabies virus glycoprotein was quantified and found in 80% of the bat species studied from caves on Cat Ba Island in Northern Vietnam. Data were obtained on changes in the levels of antibodies against the Lyssa virus. The original contribution is the primary documentation of serological markers for Lyssavirus circulation in cave bats in Vietnam. The data obtained by Assoc. Prof. Nedyalkova and her co-authors are significant for clarifying the mechanisms of viral resistance and early detection of potential zoonotic threats in the wild (publication No. 10).

- Data obtained through molecular-genetic analysis from studies on the intestinal microbiome of the bank vole (*Myodes glareolus*) and the wood mouse (*Sylvaemus sylvaticus*) from the area of Beliy Iskar village, Rila mountain, are of a certain significance for veterinary medicine, aiming to check the possible role of small rodents as carriers of the African swine fever virus (ASFV). The results do not show the existence of ASFV DNA in the intestinal contents of the studied animals, which is an additional confirmation that wild animals, with the exception of wild pigs, do not play a significant role in the epidemiology of the disease (publication No. 14).

4.4. Faunal and Population Studies

The contributions in this area of the candidate's research consist of the first presentation of detailed information on the species composition of the terrestrial fauna of Tsibar Island and the Ibisha Reserve in the Danube River. Traces of the presence of the raccoon dog (*Nictereutes procionoides*) were found - one of the most successfully spreading invasive vertebrate species in Bulgaria and Europe (publication No. 11).

I believe that the submitted report on the contributions of the candidate in the competition, Assoc. Prof. M. Nedyalkova, is concisely written, as she has focused mainly on the original and confirming contributions she has made.

I accept that the submitted report corresponds to the scientific results obtained and reflected in the publications of Assoc. Prof. Mihaela Nikolova Nedyalkova.

5. Personal Impressions

My personal impressions of Assoc. Prof. Nedyalkova are as a co-executor in some of our previous joint projects. The scientific works presented by Assoc. Prof. Nedyalkova are collective, which shows her ability to work in a team and to unite the efforts of younger specialists in the "Ecosystem Research and Ecological Risk" department in their quest to achieve higher scientific competence and professional development. These data, as well as the materials submitted for the competition, give me reason to believe that in her person, IBER will have not only a good researcher but also a good organizer of the research process.

The competition announced by the Scientific Council of IBER, BAS is for the academic title of professor. This presupposes that candidates for it, in addition to serious scientific achievements, must also have solid scientific organizational skills.

Over the years, Assoc. Prof. M. Nedyalkova has shown impressive scientific and organizational activity. As a result of her personal efforts and persistence, a long-term, fruitful collaboration was established with specialists from University, Mexico. This collaboration continues to this day, which is clearly evident from the large number of joint publications.

My personal impressions are that Assoc. Prof. M. Nedyalkova is a leading specialist in the field of ecotoxicology. By her example and organizational skills, she motivates the young specialists in her scientific circle for more in-depth and productive research activities.

I would like to pay special attention to her contribution to the preparation and successful defense of the dissertation of the PhD student Petar Ostoich. I responsibly state that although she was nominally a "scientific consultant," her help in the development and successful defense of this dissertation is as valuable as a co-supervisor.

Assoc. Prof. Nedyalkova's publications have very good citation rates. They are cited in 136 publications by Bulgarian and foreign authors, some of which are in very prestigious journals. It is noteworthy that in the eight years since her habilitation as an associate professor, she has received this large number of citations. Here I must note the great attention paid to her research related to zeolite (over 32 citations, most in a high-ranking journal). These facts once again confirm the serious contributions of Assoc. Prof. Mihaela Nedyalkova in the field of ecotoxicology.

In these years, when most specialists, including in the field of ecology, have focused their efforts on their own "points" and citations, Q-rankings, etc., she took on the ungrateful task of an administrative head and devotes time and effort to the development of the "Ecosystem Research and Ecological Risk" department and as Deputy Director of IBER as a whole.

CONCLUSION

The documents and materials presented by Assoc. Prof. Mihaela Nikolova Nedyalkova, PhD, meet all the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), the Regulation for the Application of the LDASRB, and the corresponding Regulation of IBER, BAS.

The candidate in the competition has presented a significant number of scientific works published after the materials used for the awarding of the academic title of associate professor. Her works contain original scientific and scientific-applied contributions that have received international recognition and are published in journals with a high scientific rank. Her theoretical developments have practical applicability for optimizing approaches in the assessment and reduction of ecological risk.

The involvement of Assoc. Prof. Mihaela N. Nedyalkova in important institutional and national projects is an excellent attestation for both her and the institution she represents. The results achieved by Assoc. Prof. Mihaela Nedyalkova in her research and scientific-organizational activities fully correspond to the requirements of IBER, BAS.

After reviewing the materials and scientific works presented in the competition, and analyzing their significance and the scientific and scientific-applied contributions they contain, I give my positive assessment and recommend to the Scientific Jury to prepare a report-proposal to the Scientific Council of the Institute of Biodiversity and Ecosystem Research, BAS for the election of Assoc. Prof. Mihaela Nikolova Nedyalkova to the academic position of "professor" at IBER, BAS in the professional field "4.3. Biological Sciences," scientific specialty "Ecology and Ecosystem Conservation (02.22.01)."

September 15, 2025, Sofia

Review prepared by Assoc. Prof. Margarita Topashka-Ancheva, PhD