

OPINION

by Associate Professor Dr. Detelin Stefanov Stamenov Department of "Biophysics and Radiobiology", Faculty of Biology, SU "St. Kl. Ohridski",

REGARDING: competition procedure for filling the academic position of **Associate Professor** in the scientific field 4. "Natural Sciences, Mathematics and Informatics", in the professional field 4.3. Biological sciences, scientific specialty "Physiology of plants", announced by IPPG - BAS in SG no. 22 / 15.03.2024 for the needs of the "Plant growth regulators and development" laboratory at IPPG - BAS.

To participate in the announced competition, **only one candidate**, Assistant Professor Zornitsa Ivanova Katerova-Landzhova, PhD, **from the Institute of Plant Physiology and Genetics - BAS (IPPG - BAS)**.

1. Data on the candidate Zornitsa Ivanova Katerova-Landzhova

Zornitsa Ivanova Katerova-Landzhova graduated in 1999 from the Faculty of Biology of the University of St. Kliment Ohridski" as a Master in Biotechnological Processes, specialization Industrial Biotechnologies. After completing her education in BF in 2000, he won a 5-month scholarship financed under the Tempus program AC-JEP13168-98 of the SU "St. Kliment Ohridski", Faculty of Biology, topic "Metabolic engineering in *E. coli*: effect of the aceA and acnA genes on acetate production" at the Laboratory of Industrial Microbiology and Biocatalysis, Department of Biochemical and Microbial Technologies, Faculty of Agricultural and Applied Biological Sciences, Royal University of Ghent, Belgium. From 2002 to 2008 she was a PhD student at the Institute of Plant Physiology and Genetics - BAS with the thesis topic "Physiological-biochemical changes in pea plants irradiated with UV-B and UV-C". During the period of the doctoral studies preparation, Zarnitsa Katerova-Landzhova is doing a Doctoral Specialization under the International Cooperation Program between Bulgaria (MES) and the Flemish Community Belgium, project "Monitoring the effect of Cd and UV stress on the levels of some phytohormones" in the Laboratory of Plant Physiology and Biochemistry, Faculty of Biology, University of Antwerp, Antwerp, Belgium in 2003-2004. Since 2009 she was assistant professor, scientific specialty "Plant Physiology" conducting scientific research in the field of plant physiology in economically important crops: physiological effects of UV irradiation, involvement of growth regulators; physiological response to other types of abiotic stress, involvement of growth regulators. During her work as an Assist. Prof. at IPPG, Katerova-Landzhova conducted two postdoctoral programs: 1) One-year Postdoctoral Program (FY2013 JSPS), topic "Regulation of flowering time and number of stem branches in Arabidopsis by nuclear poly(A)-binding proteins (PABN)" at the National Agriculture and Food Research Organization, Sapporo, Japan in 2013-2014. 2) Two-year Postdoctoral Program (FY2014 JSPS, Japan Society for the Promotion of Science), with the same topic at the National Agriculture and Food Research Organization, Sapporo and Tsukuba, Japan.

2. Evaluation of the report submitted by Zornitsa Ivanova Katerova-Landzhova

The documents submitted by the candidate in the competition correspond to the requirements of the Law Development of the Academic Staff of the Republic of Bulgaria (LDASRB) and the Regulations on the terms and conditions for acquiring scientific degrees and holding academic positions at IPPG, BAS.

In connection with the competition requirements, the candidate has submitted documents in accordance with the rules of the IPPG, BAS, including: European CV format; Copy of the diploma for the educational and scientific degree Doctor and a copy of the PhD abstract; Official note from the last

place of work; List and copies of all publications in specialized scientific publications; List and summaries of the publications participating in the competition; List of citations of the candidate's scientific works; Certificate of participation in scientific projects; Author reference of the scientific contributions of the works; Evidential material for the fulfillment of the minimum national requirements of the LDASRB and the Regulations for the specific conditions and procedure for occupying the academic position "associate professor" at IPPG-BAS; Copy of the State Gazette. Here I must especially note the precision with which the candidate Assistant Professor Zornitsa Ivanova Katerova-Landzhova, PhD, has submitted the required documents.

On the basis of the submitted documents, the candidate fulfills and exceeds the requirements of IPPG - BAS for the position of associate professor.

3. Analysis of the main directions and research work and personal contributions of Zornitsa Ivanova Katerova-Landzhova.

For group A indicators, Zornitsa Ivanova Katerova-Landzhova has 50 points based on the fact that she defended a PhD thesis for the award of an educational and scientific degree "PhD" on the topic "Physiological-biochemical changes in pea plants irradiated with UV-B and UV-C";

For indicators from group B indicators 3 and 4, Zornitsa Ivanova Katerova-Landzhova has 110 points out of the required 100 points and is based on 4 publications with quartile Q2, 2 publications Q3. Total JCR IF: 3.583. Publications in which Z. Katerova-Landzhova is the first or corresponding author: 35 points.

According to indicators from group D, indicators 5 to 9, there are 260 items against the required 220 items. The distribution of publications by quartiles is as follows: Q1 – 3 publications; Q2 – 3 publications; Q3 – 5 publications Q4 – 1 publication No quartile – 3 book chapters Total JCR IF: 18.642 Number of points of publications in which Z. Katerova-Landzhova is first or corresponding author with total JCR IF: 13.684.

According to Appendix 3 (indicators 10 to 12) from group D (i.e. number of citations in scientific publications, monographs, collective volumes and patents, referenced and indexed in Web of Science and Scopus), the candidate presents in a separate list citations in publications indexed in Web of Science or Scopus for the last 5 years (without auto-citations and semi-auto-citations) - 173 items. The points for this indicator are 346 with a required 100 points.

According to group E, Dr. Katerova-Landzhova was assessed with 70 points, as many as are required and are based on her participation in 6 scientific projects, of which 5 are national and 1 international.

In my opinion, the candidate Zornitsa Ivanova Katerova-Landzhova meets the national requirements under Art. 26 of LDASRB of scientific field 4. "Natural sciences, mathematics and informatics", professional direction 4.1. "Physical Sciences" and, accordingly, the requirements of IPPG - BAS for occupying the academic position of "associate professor" in the scientific field and the corresponding professional direction of the competition.

4. Overall assessment of the significance of scientific achievements Zornitsa Ivanova Katerova-Landzhova

The candidate studies the effects of (UV) radiation on plants, as well as the effects of other abiotic stresses. In both directions of scientific research, possible modulating effects of various growth regulators are sought in order to limit the harmful consequences of the studied stress factors. Plants have evolved successful UV protection mechanisms, especially when it comes to the action of UV A

radiation. The flavonoids and anthocyanins found in epidermal tissues absorb ultraviolet radiation, blocking the passage of 95 to 99% of incident UV radiation. That's why Katerova-Landzhova focuses mainly on the researched effects of UV B and UV C. On the other hand, the atmospheric ozone layer (O₃) effectively filters a large part of short-wave UV radiation (UV-C). Factors such as altitude, cloud cover reflectivity, latitude, and the ozone gradient can affect the amount of UV-B and UV-A radiation that reaches the Earth's surface. UV-C studies can rather be seen as a model system for studying the effects of high-energy radiation on plants. Therefore, I highly appreciate Katerova-Landzhova's choice to work with low doses of UV-C radiation, in order to avoid extreme damage, which in this case has no particular biological significance. I believe that such an approach will reveal new opportunities for evaluating the effects of atypical Earth UV-C radiation, which may not always be associated with harmful effects. Plants perceive UV-C supplied by artificial sources as a signal from the environment and not only a potential abiotic stress factor that affects development and acclimatization. UV-C may also be a regulator of photomorphogenesis, including inhibition of hypocotyl elongation, cotyledon expansion, and flavonoid accumulation, responses that may be precursors to the development of defense mechanisms. Such possible 'signaling' effects of UV-C can be investigated in detail if Zornitsa Katerova-Landzhova's approach of combining UV-effects with growth regulator treatments is used. I am also positive about other published studies of stresses such as drought, waterlogging and herbicide effects and the possible protective effects of growth regulators.

5. Organizational and training activity

Zornitsa Katerova-Landzhova is involved in numerous projects, which is an important part of the organization of the scientific activity of the team of which she is a member. Taking into account the fact that Katerova-Landzhova is not habilitated, this limits her activity at the level of organizational activity in IPPG. I would recommend the candidate to look for opportunities to work with university organizations in order to develop opportunities to educate students and involve them in her future projects.

6. Critical notes and recommendations

Rather, I have recommendations for Assistant Professor Zornitsa Katerova-Landzhova, which I have examined in the Organizational and training activity section.

7. Conclusion on the application

On the basis of the presented materials, I confirm that they meet and exceed the requirements of LDASRB, the Regulations for its application and the Regulations of IPPG - BAS for the candidate's occupation of the academic position "Associate Professot" in the scientific field and the professional direction of the competition. I give my positive assessment and based on the above, I recommend the scientific jury to propose to the competent authority for the selection of IPPG - BAS to choose Zornitsa Ivanova Katerova-Landzhova to occupy the academic position "Associate professor" in professional direction 4.3. Biological Sciences, scientific specialty "Plant Physiology".

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Prepared the opinion:

Sofia

/ Assoc. Dr. Detelin Stefanov/