BRIEF REFEREE REPORT

by Assoc. Prof. Mariyana Hristova Gozmanova, Ph.D.,

appointed as a member of the scientific jury by Order No. RD-01-43/20.09.2024 from the Director of the Institute of Plant Physiology and Genetics (IPPG), Bulgarian academy of Sciences (BAS)

Regarding: the competition for the academic position of "Associate Professor" in the field of higher education 4. Natural Sciences, Mathematics, and Informatics, professional field Biological Sciences, scientific specialty "Biochemistry"

In the competition for the position of Associate Professor, announced in State Gazette, issue No. 62/23.07.2024, for the needs of the “Photosynthesis - Activity and Regulation” laboratory, Chief Assistant Prof. Gergana Mihailova, Ph.D., is participating. The submitted materials are in accordance with the requirements of the Law on the Academic Staff Development in Republic of Bulgaria, the Regulations for its implementation and the Regulations for the specific conditions and procedure for acquiring scientific degrees and holding academic positions in IPPG, BAS.

1. General Information on the Career and Thematic Development of the Candidate

Gergana Kirilova Mihailova completed her MSc degree in Biochemistry at the Faculty of Biology, Sofia University “St. Kliment Ohridski” in 2006. In 2012, she obtained her PhD in "Biochemistry" at BAS with a dissertation titled “Desiccation of the resurrection plant *Haberlea rhodopensis* under high-temperature conditions and different light regimes.” She began working as an Assistant at the IPPG at BAS in 2009, and since 2012, she has held the position of Chief Assistant. In 2014, she completed a specialization through COST STSMs at the Instituto Valenciano de Investigaciones Agrarias in Valencia. According to the Scopus database (Scopus ID 6507123439), between 2012 and 2024, Chief Assistant Prof. Gergana Mihailova, Ph.D., has authored 36 publications, has been cited 198 times (excluding self-citations), and has an h-index of 8.

2. Evaluation of the submitted report for compliance with the requirements of Article 26, Paragraph 1 of the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRASRB) and the specific requirements for holding the academic position of "Associate Professor" as outlined in Appendix 1 of the Rules for the Specific Conditions and Procedures for Obtaining Academic Degrees and for Holding Academic Positions at the IPPG

For the competition for the academic position of "Associate Professor," Gergana Mihailova has submitted **19** scientific publications, including **12** in Q1 journals, **2** in Q2, **1** in Q3, **1** publication indexed in Scopus without an impact factor but with an SJR, **3** without an impact factor or SJR, and **1 book chapter**. The total impact factor of the submitted publications is **43.952**. In **7** of these publications, Gergana Mihailova is **the first or corresponding author**, which demonstrates her personal contribution to these works. Dr. Mihailova has also participated as a team member in **6** national and **3** international projects. Based on the submitted materials, I believe they meet the minimum requirements of ZRASRB and the specific requirements for the academic position of "Associate Professor" at IPPG.

Quantitative Indicators of Chief Assistant Prof. Gergana Mihailova, Ph.D.

- **Criterion A (min. 50 points) – 50 points**
  Dr. Mihailova obtained her Ph.D. in Biochemistry in 2007 after defending a dissertation titled "Desiccation of the Resurrection Plant *Haberlea rhodopensis* under High-Temperature Conditions and Different Light Regimes."
- **Criterion B (min. 100 points) – 100 points**
  Four Q1 publications have been submitted, with a total impact factor of 10.657. These publications do not overlap with those submitted for obtaining her Ph.D. degree or the academic position of Chief Assistant.
- **Criterion G (min. 220 points) – 280 points**
  Under indicator 7, **15 publications** have been presented, indexed in internationally recognized scientific databases (Web of Science and Scopus), in categories Q1 – Q4, with a cumulative JCR impact factor of **33.295** for the year of publication. In **7** of these publications, Dr. Mihailova is listed as **the first or corresponding author**. Under Indicator 8, a **book chapter** *Handbook of Photosynthesis*, edited by M. Pessarakli, Third Edition, CRC Press, Taylor & Francis Group is presented.
- **Criterion D (min. 100 points) – 392 points**
  This includes 196 citations in Web of Science or Scopus (excluding self-citations and partial self-citations) (196 x 2 = **392** points).
- **Criterion E (min. 70 points) – 120 points**
  This includes participation in **6** national research projects (Indicator E14) and **3** international research projects (Indicator E15).

After reviewing the provided materials, I consider the candidate's publication activity to be **very strong**. The total score of Chief Assistant Prof. Mihailova, Ph.D. (**942 points**), **significantly exceeds** the required minimum of 540 points.

3. Analysis of the main directions in the candidate's research work and the most important results in each, highlighting her/his personal contribution

Dr. Mihailova's research focuses on adaptive mechanisms of the resurrection plant *Haberlea rhodopensis* in response to various abiotic environmental factors. Biochemical and physiological changes have been studied during periods of drought, rehydration, and low-temperature stress. She investigates the leaf anatomy (B4-01, B4-02), the ultrastructure of chloroplasts, and the organization and integrity of thylakoid membranes (B4-02, G7-08, G7-10). Data on chlorophyll content (G7-03), the photochemical activity of PSII, and energy transfer between photosystems in plants grown under different light intensities have been obtained (B4-03, G7-01, G7-02, G7-04).

A comparative study was also conducted on the changes in pigment-protein complexes, levels of photosynthetic proteins involved in the light reactions of photosynthesis, and the content and profile of soluble sugars in sun-exposed and shade-grown plants from different habitats under drought conditions (B4-02, G7-07, G7-08) and low-temperature stress (G7-11, G7-13). Additionally, gene expression related to sugar metabolism and stress response in plants was analyzed, laying the foundation for future research on the molecular mechanisms responsible for plant tolerance to drought and low-temperature stress (G7-09; G7-13).

The role of non-enzymatic antioxidants, such as flavonoids and glutathione, as well as the activity of antioxidant enzymes including superoxide dismutase (SOD) and ascorbate peroxidase, was highlighted in the process of drought response at optimal and low temperatures (B4-04, G7-05, G7-12, G7-14). This research outlines the morphological, structural, biochemical, and physiological changes in the leaves of the resurrection plant, contributing to its tolerance to drought and low temperatures (G8-01, G7-13, G7-15).

In addition to *H. rhodopensis*, two species from the genus Ramonda were included in the studies on cold tolerance, thereby expanding the scope of research on resurrection plants. This allows for a more in-depth understanding of the common and specific mechanisms in the physiology and molecular biology of these plants as they overcome adverse environmental conditions.

4. A reasoned response regarding the extent to which the candidate has a clearly defined and current scientific theme, indicating its significance for science and society

The submitted materials demonstrate a strong interest in plant physiology and contain original scientific and applied contributions that confirm the candidate's competence and experimental expertise in this area.

5. Organizational and training activities

Since 2012, Chief Assistant Prof. Mihailova has been a secretary of the sections "Photosynthesis" and "Physiology and Biochemistry of Plants," as well as a secretary of the General Assembly of the Institute of Plant Physiology and Genetics (IPPG) at BAS. She has participated in seminars organized in Bulgaria and abroad. Chief Assistant Prof. Mihailova also supervises bachelor's thesis work in the Department of Plant Physiology at the Faculty of Biology at Sofia University. Additionally, she also co-supervised pre-graduation internships of students from New Bulgarian University (540 hours of educational and pedagogical work).

6.Critical remarks and recommendations

I have no critical remarks regarding the submitted documents.

7. Reasoned positive or negative conclusion regarding the selection
The documents and materials submitted by Chief Assistant Prof. Gergana Mihaylova meet all the requirements of the Law on the Academic Staff Development in the Republic of Bulgaria, the Regulations for its implementation and the Regulations of IPPG, BAS. After reviewing the materials and scientific works presented and analyzing their significance, I give my **positive assessment** of the academic performance of Ch. Assit. Prof. Dr. G. Mihailova in this competition. I recommend to the Scientific Jury to prepare a report- proposal to the Scientific Council of IPPG, BAS **for the election of Chief Assistant Prof. Gergana Mihailova of the academic position of 'Associate Professor'** in the field of higher education 4. Natural Sciences, Mathematics, and Informatics, professional field 4.3. Biological Sciences, scientific specialty “Biochemistry.”

November 11, 2024

/Assoc. Prof. Dr. Mariyana Gozmanova/