

## STATEMENT

by **Prof. Dr. Marina Ivanova Stanilova**,

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Member of the Scientific Jury, according to Order No. ПД-01-19/15.05.2025 of the Director of the Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences (IPPG-BAS), by competition for the academic position of "Associate Professor" in the field 4. Natural Sciences, Mathematics and Informatics, professional field 4.3. "Biological Sciences", scientific specialty "Genetics", for the needs of the "Plant Growth and Development Regulators" laboratory, according to the announcement in the State Gazette No. 24/21.03.2025, with the sole candidate **Senior Assistant Professor Dr. Krasimira Nedyalkova Tasheva**.

**1. General data on the candidate's career and thematic development.** Krasimira Tasheva graduated with a master's degree in molecular biology in 2000 at the Faculty of Biology of Sofia University "St. Kliment Ohridski". Her entire professional career has been at the Bulgarian Academy of Sciences: she began in 2001 as a biologist at the Institute of Genetics, where she rose to the rank of Associate Professor, and since 2011 she has continued her development at its successor, the Institute of Plant Physiology and Genetics. In 2011 she obtained the educational and scientific degree "Doctor" in the scientific specialty "Genetics", with the topic of her dissertation "*In vitro* cultures of *Rhodiola rosea* L. – study of the possibilities for propagation and preservation of the species and for the production of biologically active substances". From her student days to the present, Dr. Tasheva's research interests have been in the field of genetics, plant biotechnology and bioinformatics, aimed at studying valuable plant species and developing *in vitro* models to increase their productivity, stimulate the biosynthesis of secondary metabolites and protect endangered species. All the while, she improved her qualifications: she won two short-term scholarships (in bioinformatics in June 2010, at the International Center for Genetic Engineering and Biotechnology in Trieste, Italy; in March-May 2012 under the EEA Financial Mechanism program, at the Department of Molecular Biology, University of Oslo, Norway), and for the period from 2007 to 2023, she participated in 25 short training courses, conducted in Bulgarian or English, related to computer literacy, data analysis with statistical methods, plant physiology (photosynthesis, stress tolerance), genetics and molecular biology (possibility for genetic improvement of cultivated plants, assessment of GMOs in foods, DNA visualization of food pathogens, etc.), while mastering various modern research methods: PCR, microscopic methods, specialized software, etc. It is noteworthy that some of the courses were aimed at finding ways to finance research work and opportunities for practical application of its results: familiarization with EU financial instruments, structural funds and operational programs for Bulgaria, patent legislation, etc., which shows an interest in acquiring skills for organizing, managing and financially securing scientific developments, which are very important for building leadership skills and for the success of scientific teams. Tasheva is a member of the Union of Scientists in Bulgaria, section "Physiology and Biochemistry of Plants" and of FESPB (Federation of European Societies of Plant Biology).

**2. Assessment of the submitted reference for compliance with Article 26, paragraph 1 of the Law on the Development of the Academic Staff of the Republic of Bulgaria and with the specific requirements of the IPPG for holding the academic position of "Associate Professor".** The candidate meets all scientometric requirements for holding the academic position of Associate Professor. The total number of points scored is 885, which far exceeds the required minimum of 540 points. She participates in the competition with 17 out of a total of 42 publications. According to Indicator B-4, 4 publications are included, published in prestigious specialized scientific journals, refereed and indexed in the world-famous databases Web of Science and Scopus, all with a quartile of Q1, and she is a corresponding author of 2 of them (2 in Plants, 2023; 1 in Biology, 2024; 1 in Applied Sciences, 2025), bringing her the necessary 100 points. The publications meet the requirements of Art. 24, para. (1) item 3 of the LDASRB for habilitation work. In Group of indicators G, the candidate has scored 237 points with a required minimum of 220, participating with 13 publications outside the habilitation work: 12 in journals referenced and indexed in Web of Science and/or Scopus and 1 chapter of a book. In 7 of them, she is the first and/or corresponding author (in 3 she is corresponding and first, in 3 she is first and in 1 she is corresponding), thus exceeding the specific requirement of the IPPG for a minimum number of points from publications in which she is the first and/or corresponding author (scored 120 points with a required 70 when leading a project). According to Indicator D: citations in prestigious scientific journals, excluding self-citations, Tasheva scored 378 points, which is significantly above the required minimum of 200 points. This is evidence of the quality of her publications, as 30 publications were cited a total of 189 times in journals in Scopus and in Web of Science for the period 2003 - 2024, with a total number of 374 citations of 34 publications; her *h* index is 6 according to Web of Science and Scopus. According to Indicator E, 120 points were scored with a required minimum of 70 points, from leading 2 national scientific projects (40 points), attracting funds for them (30 points) and participating in 1 international scientific and 3 national scientific or educational projects (20 + 30 points), developed in the period from 2011 to the present; 3 of the projects are ongoing, and Tasheva is the manager of 1 of them, funded by the National Science Foundation. In addition to the mandatory scientometric requirements, it is worth noting that Tasheva has successfully integrated into the international scientific space, with a total of 38 participations in scientific forums: 8 participations in 6 conferences in Bulgaria and 30 participations in 18 conferences abroad, in 11 countries.

**3. Main directions of scientific research work, most important results and personal contribution of the candidate.** Tasheva's professional path is entirely oriented towards the study of plant species, valuable from the point of view of both biodiversity and their usefulness to humans. Two main directions have been outlined, which complement each other: Application of biotechnological methods for *in vitro* cultivation of valuable medicinal plants, some of which are endangered, and stimulation of biosynthesis of secondary metabolites; Study of the action of plant extracts as potential therapeutic agents in oncological diseases and Alzheimer's syndrome. The comparative analysis between the content and composition of biologically active substances in wild-growing, *in vitro* propagated and *ex situ* cultivated plants of the same species, as well as the antitumor and antioxidant effects of their extracts (*Sideritis scardica*, *Clinopodium vulgare*, *Rhodiola rosea*) is very valuable. The

inclusion of bioinformatics analysis of experimental data helps to optimize the conditions for the accumulation of biomass and secondary metabolites of interest. Fundamental research leads to results of practical value, e.g. the proven stronger antitumor effect of extracts from *in vitro* propagated and cultivated plants of *S. scardica* compared to wild ones will help in the conservation of this endangered species; the established advantages of extracts from *in vitro* propagated plants of *C. vulgare* (highest antiproliferative activity against cancer cell lines, combined with the lowest toxicity to non-tumor human cells and the ability to inhibit the migration of cancer cells and induce apoptosis in them) opens the possibility of obtaining non-toxic anticancer preparations.

Tasheva's collaboration with scientists from various institutes of the Bulgarian Academy of Sciences and Sofia University is impressive, which is normal in interdisciplinary research. However, her personal contribution is undeniable, mainly related to the development of protocols for *in vitro* and *ex vitro* cultivation of all target plant species, preparation of extracts from them, phytochemical and cytological studies, bioinformatics analyses, and what is more important: formation of an initial scientific concept and planning of experiments (evident from the reference in MDPI publications), conducted mainly on projects led by her, as well as preparing the results for publication. The review article and the book chapter demonstrate skills in summarizing results from her own and other studies.

**4. A motivated answer regarding whether the candidate's topic is clearly outlined and relevant, and regarding its significance for science and society.** The scientific topic is definitely clearly outlined and relevant, and if it had to be summarized in one sentence, it is the application of innovative biotechnological approaches aimed at the sustainable use of medicinal plant species, some of which are endangered, in the treatment of socially significant diseases such as cancer and dementia. From the results obtained so far and the prospects for future research, it is clear that Tasheva intends to pursue the chosen topic, expanding and deepening biotechnological approaches, e.g. production of secondary metabolites in bioreactors and development of innovative *in vitro* models based on genetic and bioinformatics modern methods in valuable and endangered plant species; application of more precise analytical methods for studying the dynamics of plant cell metabolism; introduction of *in silico* methods for optimizing experiments through modeling of biochemical, physiological, pharmacological, toxicological, etc. systems and processes. The need to attract young scientists to the team is also taken into account, as well as the exchange of experience and expertise with scientists from the same scientific field, which is a prerequisite for the successful development of science. From the overall review of Tasheva's scientific work and the identified prospects, one can see purposefulness, competence, continuous improvement of knowledge and skills, and personal concern for both human health and the protection of nature, in particular the most vulnerable part of the plant world: medicinal plants.

**5. Organizational and training activities.** Tasheva has emerged as a scientist with a responsible attitude towards the organization of the research process and the training of young scientists. She enjoys the trust of her colleagues, as evidenced by her participation in 2 committees at the IPPG: on academic ethics and on accreditation of the doctoral program in the scientific specialty "Genetics". She is the supervisor of a young researcher who successfully defended her bachelor's thesis in 2024 and is currently developing a master's

thesis at the Sofia University. She has trained 3 doctoral students at the Doctoral School of the Bulgarian Academy of Sciences in the period 2021 - 2024 on a specialized course on the topic "Plant Biotechnology". Over the past 3 years, she has prepared 25 reviews, of which 2 public and 23 anonymous, of scientific articles for prestigious journals. She also actively participates in promoting scientific achievements among the general public, during the European Night of Scientists in 2023, the "Science and Business" meeting, etc.

**6. Critical remarks and recommendations.** I have no critical remarks on the substance. Technical errors noted: the total number of points for all indicators is 885, not 887; there is no semi-auto-citations category, citations by co-authors are also auto-citations; as a source of funding for several projects, the Ministry of Education, Youth and Sciences is noted, instead of the Ministry of Education and Sciences; duplication of 2 conference participations. According to the Red Book of the Republic of Bulgaria, *Sideritis scardica* is an endangered species, and *Rhodiola rosea* is a critically endangered species.

**7. Motivated conclusion for selection.** In conclusion, as a result of everything stated above, I strongly recommend to the esteemed Scientific Jury to evaluate the activities of Senior Assistant Professor Dr. Krasimira Nedyalkova Tasheva and to vote positively for her election to the academic position of "Associate Professor" in professional field 4.3 "Biological Sciences", scientific specialty "Genetics".

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