

STATEMENT

BY Anita Georgieva Tosheva, PhD, Associate Professor,
Faculty of Biology, Sofia University “St. Kliment Ohridski”,
a member of the Scientific Jury, appointed by Order no. 65/04.10.2024
of the Director of IBER-BAS.

Concerning the materials submitted for the competition for the academic position **Associate Professor** at the Institute of Biodiversity and Ecosystem Research, BAS (**IBER-BAS**) in the area of higher education 4. Natural Sciences, Mathematics and informatics, professional field 4.3. Biological Sciences, scientific specialty Botany, for the needs of the Resource assessment and monitoring of rare, medicinal and aromatic plants RG, Division of Applied Botany, Department of Plant and Fungal Diversity and Resources, announced in SG ed. 66 on 06.08.2024.

General presentation of the procedure and the candidate

In the competition for Associate Professor, announced in the State Gazette no. 66/06.08.2024 and on the webpage of the IBER-BAS, as sole candidate participates **Assistant Professor Boriana Zdravkova Sidjimova, PhD** in Department of Plant and Fungal Diversity and Resources, IBER-BAS.

The documents submitted by the applicant in electronic form are in accordance with all requirements of the Act for the development of the academic staff in the Republic of Bulgaria (ADASRB), the Regulations for the Application of the ADASRB, the Rules for the conditions and the order for acquiring scientific degrees and occupying academic positions in BAS and at IBER-BAS and meets and exceeds the criteria of IBER-BAS for the occupation of the academic positions “Associate Professor” in the professional field 4.3. Biological Sciences.

Boriana Sidjimova is graduate in Biology, specialisation Medicinal plants (Master's Degree) in Faculty of Biology at the Sofia University “St. Kliment Ohridski” in 2001. She successfully defended a PhD thesis entitled “Biological and phytochemical study of species from genus *Galanthus* L. (snowdrop) in Bulgaria” at the Institute of Botany - BAS in 2008 (educational and scientific degree ‘Doctor’ in the professional field 4.3. Biological Sciences). In the period 2001-2003 and 2007-2013 she was a biologist at the Institute of Botany/IBER-BAN. Since 2013, she has been an Assistant Prof. at the Department of Plant and Fungal Diversity and Resources at the IBER-BAS. Dr. Sidjimova has educational activities as a part-time lecturer in Botany (practical classes and training practice) with over 1900 hours at Sofia University “St. Kliment Ohridski”. She is a Member of Bulgarian Botanical Society.

Assistant Prof. Sidjimova has submitted a list of 28 publications for her scientific production for participation in the competition for academic positions “Associate Professor”, clearly separating publications presented in this competition and those used in previous procedures. For the competition, the candidate has applied with a total of 23 publications which

are published after the materials used in the defence of her PhD thesis (indicator A) and divided into two groups, covering indicators C and D for the academic positions “Associate Professor” in the professional field 4.3. Biological Sciences, in accordance with the Rules for the conditions and procedures for acquiring scientific degrees and for occupying academic positions at BAS.

From this list, 7 scientific publications are equated to Habilitation thesis, indicator C - scientific publications in journals, that have been referenced and indexed in world-famous scientific information databases (Web of Science or Scopus), distributed by quartiles: Q1 – 2 publications (No. 3, 5), Q2 – 1 publication (No. 2), Q3 – 3 publications (No. 1, 6, 7), Q4 – 1 publication (No. 4), which are rated 110 points, with the required 100 points. I accept publications No. 3 and No. 4 according to the specified quartiles of the journals in the Scopus database, rated respectively with 25 points (publication No. 3) and with 12 points (publication No. 4), with a total of 127 points for indicator C.

In the second group, indicator D - scientific publications in journals, that have been referenced and indexed in world-famous scientific information databases (Web of Science or Scopus), there are 16 publications, distributed by quartiles: Q1 – 2 publications (No. 18, 21), Q2 – 3 publications (No. 11, 14, 16), Q3 – 5 publications (No. 8, 9, 12, 17, 22), Q4 – 4 publications (No. 10, 13, 19, 20), and one book chapter, with a total of 250 points with 220 points required. I accept publications No. 10, 13, 16, 19 and 20 according to the specified quartiles of the journals in the Scopus database, rated respectively with 20 points (publication No. 16) and with 12 points (publications No. 10, 13, 16, 19), with a total of 268 points for indicator D.

List of 42 citations in scientific editions, referenced and indexed in Web of Science or Scopus is presented (indicator E), which are rated 84 points, with the required 60 points. The Scopus database contains 26 articles and they have a total of 153 citations. According to the same database, the *h*-index of Dr. Sidjimova is 6 (all of the above numbers are after excluding autocitations). The results of the research activity of the candidate have been reported at international and national scientific forums. Information on the participation in above than 20 national and international projects is provided.

The attached author's account shows that Assistant Prof. Sidjimova fulfills the minimal national requirements for occupying the academic position of “Associate professor” (Indicator A fulfills national requirements, Indicator C is scored 127 points against the required 100 points, Indicator D is 268 with 200 points required, indicator E is 84 (required 60 points). In the habilitation extended reference for the scientific contributions, the candidate includes the scientific papers from the attached lists, referred to both indicators "C" and "D".

General characteristics of the candidate's activities

The research activity of Dr. Sidjimova includes various fields, mainly related to Medicinal plants - phytochemical studies of secondary metabolites, resource assessment of medicinal plants, monitoring of species of conservation importance, cultivation of medicinal plants, including techniques and methods for hydroponic, as well as development of Management Plans for protected areas.

The research in the publications included in the Habilitation thesis (7 publications) is a contribution to the study of phytochemical and biosystematic research of species from the family Amaryllidaceae – alkaloid composition, chemotaxonomic studies, biological activity. Distribution and taxonomy of species of the genus *Galanthus* in Bulgaria were studied, and

morphological, anatomical, comparative-embryological and genetic studies are covered. As a result of the phytochemical studies, new alkaloids were identified and described for the *Galanthus*, a study on the alkaloid composition in individual plant organs was conducted for the first time, different biosynthetic pathways of the alkaloids in *G. nivalis* and *G. elwesii* were established, and it was proved that the alkaloid composition does not change during cultivation and can be used as chemotaxonomic markers. Other species were also analyzed, for the first time *Hippeastrum papilio* was studied as a new and prospective source of galantamine for the pharmaceutical industry, as well as the cultivar *Narcissus* cv. *Hawera*.

The scientific research of Dr. Sidjimova in the publications by group of indicators D represents a continuation of studies of the phytochemical studies of alkaloids, but has been expanded with the study of other groups of chemical compounds, biodiversity, resource potential and the cultivation of economically important plants. The scientific results could be grouped into the following main contributions:

- Phytochemical studies were conducted on a number of representatives - *Tribulus terrestris*, *Hippeastrum papilio*, *Narcissus pallidulus*, *Narcissus* cv. *Hawera*. Focus is placed on the analysis of different morphological parts, chemical compounds, biological activities and quantitative differences of the compounds between wild populations or from *in vitro* cultivated plants.
- The metabolic profile of *Hippeastrum papilio* in different plant organs was studied, and a comparative analysis of diploid and autotetraploid plants revealed differences in their metabolic profile and autotetraploidization leads to an increase in the alkaloid content. It has been established that the anatomical features of the stomata, especially their size, can be used as a rapid screening method for obtaining autotetraploids. The dynamics of biomass development under *in vitro* cultivation conditions were also analyzed.
- A methodological contribution is that the methods for sample preparation and analyzing the results of the GC-MS analysis are presented in a synthesized form. The scientific information that Gas Chromatography and Mass Spectral Analysis (GC-MS) is a suitable method for metabolic profiling of plant samples from *in vitro* cultures is summarized.
- The biodiversity and resource potential of the medicinal plants *Tribulus terrestris*, *Colchicum autumnale*, *Rhodiola rosea* which are economically important for the pharmaceutical industry, were studied.
- The biological activity of essential oils and alkaloids from representatives of the families Asteraceae, Lamiaceae and Amaryllidaceae was analyzed. It was found that essential oils of the studied species exhibited AChE activity, comparable to that of representatives of the Amaryllidaceae. For the first time it was found that the alkaloid extract of *Narcissus* cv. *Hawera* can damage the DNA of *Chlamydomonas reinhardtii*, and Amaryllidaceae alkaloids have inhibitory activity against endophytic fungi.

The results of the research activity of the candidate have been published in reputable international impact factor journals in the field: *Industrial Crops & Products* (IF₂₀₂₂: 5.9), *Molecules Journal of Plant Physiology* (IF₂₀₂₃: 4.0), *Planta* (IF₂₀₂₃: 3.6), *South African Journal of Botany* (IF₂₀₂₁: 3.111), *Rapid Communications in Mass Spectrometry* (IF₂₀₂₁: 2.586), *Chemistry & Biodiversity* (IF₂₀₁₁: 1.804), *Caryologia* (IF₂₀₁₈: 1.174), etc.

Assessment of the applicant's personal scientific contributions

The personal contribution of Dr. Sidjimova to the experimental development, interpretation and publication of the results in the presented materials is obvious and significant. In 40 % of publications, she is the first or second, and / or corresponding author of, which demonstrates her leading role. The submitted habilitation report of the scientific contributions correctly summarizes the work performed and reflects the theoretical and applied results achieved.

Critical Remarks and Recommendations

I have no critical remarks or recommendations to the documents presented by the candidate, as well as on her scientific activity.

CONCLUSION

The documents submitted by Assist. Prof. Boriana Zdravkova Sidjimova, PhD are **in accordance with all the requirements** of the Act for the development of the academic staff in the Republic of Bulgaria (ADASRB) and the Rules for the conditions and the order for acquiring scientific degrees and occupying academic positions in BAS and at IBER-BAS.

The candidate has presented a significant number of scientific works, published after the materials used in the defence of her PhD thesis. The publications in reputable international journals testify to the high scientific level of research.

The results achieved by Dr. Sidjimova and her research activity **fully match** with the specific requirements of the Rules for the conditions and the order for acquiring scientific degrees and occupying academic positions in BAS and at IBER-BAS and **fully attest her scientific qualifications**.

After getting acquainted with the materials for the competition and the scientific works, and after analysing their significance and the scientific and applied contributions, I find it reasonable to give my **positive assessment** and to recommend to the Scientific Jury to prepare a report proposal to the Scientific Council of IBER-BAS for the election of Assist. Prof. Boriana Zdravkova Sidjimova, PhD, for the academic position of **Associate Professor** in IBER-BAS in the professional field 4.3. Biological Sciences, scientific specialty Botany.

11 November 2024
Sofia

Statement Author:
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