



OPINION

of Associate Prof. **Dimitrina Zhivkova Zheleva-Dimitrova, PhD**

Department of Pharmacognosy, Faculty of Pharmacy, Medical University-Sofia
External member of the scientific jury with Order № P-3080/24.10.2023 of the Rector of the
Medical University-Plovdiv

Regarding: the procedure for obtaining the Academic degree “**Associate professor**” in the Higher education area 7. Healthcare and sports, professional field 7.3. Pharmacy, in the scientific specialty “**Pharmacognosy and phytochemistry**” of the Department “Pharmacognosy and Pharmaceutical Chemistry”, for teaching in Bulgarian and English in the discipline “Pharmacognosy and Phytochemistry”, MU-Plovdiv, announced in the Bulgarian State Official Journal № 59 11.07.2023, according to the confirmed offer of Faculty Council of Faculty of Pharmacy, MU-Plovdiv (№8/18.10.2023 г.).

As participants in the announced procedure, two candidates who have applied documents. The candidates are as follows: **chief assist. prof. Diana Karcheva-Bahchevanska, PhD** from the Department “Pharmacognosy and Pharmaceutical Chemistry”, Faculty of Pharmacy, MU-Plovdiv and **chief assist. prof. Paolina Lukova-Katsarova, PhD** from the Department “Pharmacognosy and Pharmaceutical Chemistry”, Faculty of Pharmacy, MU-Plovdiv.

I. Candidates career development.

Ch. assist. prof. Diana Karcheva-Bahchevanska, PhD

Ch. assist. prof. **Diana Karcheva-Bahchevanska, PhD** graduated with a degree of “Professional Bachelor” in the specialty “Pharmacist's Assistant” at the Medical College of MU-Plovdiv in 2006, and higher education in the specialty “Pharmacy”, with the degree “Master of Pharmacy” in 2012 at MU-Plovdiv. In 2018 she obtained PhD degree in the specialty of Pharmacognosy and phytochemistry at MU-Plovdiv with a PhD thesis, entitled: “Investigation of the functional properties of polyphenol extracts of species from the genus *Vaccinium* L. on enzymes of carbohydrate metabolism”. The same year she obtained the specialty “Medicinal plants and phytopharmaceutical products” from MU-Plovdiv. She worked as a researcher at the Biochemistry and Microbiology Laboratory at the Technology Center of Plovdiv University „Paisii Hilendarski” since 2015 until 2018. Since 2012 until now, she has worked consecutively as an assistant and chief assistant in Pharmacognosy, at the Department of Pharmacognosy and Pharmaceutical Chemistry at MU-Plovdiv. Ch. assist. prof. **Diana Karcheva-Bahchevanska, PhD** is also the administrative manager of the Department of Pharmacognosy and Pharmaceutical Chemistry, MU-Plovdiv.

Ch. assist. prof. Paolina Lukova-Katsarova, PhD

Ch. assist. prof. **Paolina Lukova-Katsarova, PhD** graduated with a degree “Master of Pharmacy” in the specialty “Pharmacy”, in 2012 at MU-Plovdiv. In 2018 she obtained PhD degree in the specialty of Pharmacognosy and phytochemistry at MU-Plovdiv with a PhD thesis, entitled: “Investigation of the prebiotic potential of polysaccharides in some species from the genus *Plantago* L., distributed in Bulgaria”. The same year she obtained the specialty “Medicinal plants and phytopharmaceutical products” at MU-Plovdiv. Since 2012 until 2018 she worked as an

assistant, and since 2018 she is a chief assistant in Pharmacognosy, in the Department of Pharmacognosy and Pharmaceutical Chemistry at MU-Plovdiv.

II. Educational-teaching activity.

Ch. assist. prof. Diana Karcheva-Bahchevanska, PhD

As a chief assistant professor, **Diana Karcheva-Bahchevanska**, PhD is a lecturer in "Pharmacognosy" and participates in the training of pharmacy students to obtain the "Master's" and "Professional Bachelor" degrees, as well as an academic instructor of pharmacy students in the program "Student practice Phase 1" of Ministry of Education and Science, MU-Plovdiv. She is the supervisor of an intern from Polytech Clermont, France in the "Erazym+" Program. According to the presented documents, the educational horarium of the candidate for the last two years is **2138 school hours** (lectures: 402 sc. hours and practical classes: 1736 sc. hours).

Ch. assist. prof. Paolina Lukova-Katsarova, PhD

As a chief assistant professor, **Paolina Lukova-Katsarova**, PhD is a lecturer in "Pharmacognosy" and participates in the training of pharmacy students to obtain the "Master's" and "Professional Bachelor" degrees. She participated in Erasmus+ mobility program in Bratislava, Slovak Republic, Clermont-Ferrand, France, Amiens, France. According to the presented documents, the educational horarium of the candidate for the last two years is zero due to the use of paid and non-paid pregnancy and maternity leave. Due to this fact, the candidate applied an academic statement for the academic years 2019/2020, 2018/2019 and 2017/2018. According to the presented documents, the educational horarium of the candidate for the last two years (2019/2020, 2018/2019) is **1566 school hours** (lectures: 210 sc. hours and practical classes: 1356 sc. hours).

III. Scientific-research activity

Ch. assist. prof. Diana Karcheva-Bahchevanska, PhD

1. Habilitation thesis – monograph

In the current competition, Dr. **Diana Karcheva-Bahchevanska** participates with a monograph entitled: "HPTLC - application and possibilities in the analysis of substances with plant origin". 2023. ISBN 978-619-04-0029-5, Author Diana Karcheva-Bahchevanska.

2. Scientific publications

Dr. **Diana Karcheva-Bahchevanska** applied for participation in the current competition 30 scientific publications, including 16 with an impact factor. **The original articles are 26** (14 in journals with an impact factor). There are **5 review articles** (№ 12, 13, 20, 29, 30). There are 20 scientific publications in publications referred and indexed in world-renowned databases, and 10 scientific publications in non-refereed journals with scientific review. Of the presented scientific publications, 27 are in English and 3 (№ 28, 29, 30) are in Bulgarian. There are no publications duplicated in the PhD thesis abstract and the habilitation work-monograph. The total impact factor of the submitted publications is **54.95**. The total number of citations is 128, including 92 citations in scientific publications, referenced and indexed in Scopus and Web of Science. **H-index (Scopus) = 6**. All publications are in the field of pharmacognosy and phytochemistry.

3. Scientific contributions

The main scientific contributions of Dr. **Diana Karcheva-Bahchevanska** are in the field of pharmacognosy and phytochemistry, with focus on the chemical composition and biological activity of various plant taxa. In the recent years, Dr. **Diana Karcheva-Bahchevanska** aimed her scientific potential to different analytical methods as HPTLC, GC-MS, etc. The objects of her research are species of the genus *Tanacetum*, *Vaccinium*, *Echinophora*, *Rhaponticum*, etc. Her focus on extremely current subjects such as plant-based adaptogens and approaches to controlling obesity with plant-based diets is also impressive.

According to the presented documents, the scientific contributions of Dr. **Diana Karcheva-Bahchevanska** can be considered in three main directions:

3.1. Scientific aspect - data on the benefits of adaptogens of plant origin are summarized, based on the results of a number of research studies, and future directions for research on these taxa are outlined. A large-scale systematic review was performed on plant-based diets that may play an essential role in future strategies for weight reduction, obesity control, and control of some chronic, socially significant diseases.

3.2. Scientific-applied aspect - the inhibitory effect of fruit *Vaccinium myrtillus* L extracts, widespread in Bulgaria, on the key enzyme α -amylase was investigated. The first histochemical study was conducted to describe the localization of an essential oil from *Echinophora tenuifolia* subsp. *sibthorpiana*, *Rhaponticum carthamoides*, cultivated in Bulgaria. Evaluation of the chemical composition and acute and subacute toxicity of *Tanacetum vulgare* essential oil and *T. parthenium* was performed. The phytochemical profile of *T. macrophyllum* essential oil originating from Bulgaria was determined. The chemical composition of *Cardaria draba* essential oil was determined. Essential oils from seeds of Bulgarian and Indian populations of fenugreek were studied and obtained by secondary distillation of hydrolate to extract the residual essential oil of them. *Plantago* polysaccharides were extracted and their biological activity was evaluated. In her monograph "HPTLC - application and possibilities in the analysis of substances of plant origin", the candidate presents useful information on the subject under consideration, as well as her own research. The advantages of HPTLC compared to other more common chromatographic techniques are presented.

3.3. Applied aspect - The need for mandatory analytical control for nutritional supplements has been thoroughly analyzed and argued. Dr. **Diana Karcheva-Bahchevanska** has participated in different studies that found discrepancies between the labeled content of nutritional supplements and their real qualitative and quantitative composition. Comparative analyzes were also conducted on the chemical composition of essential oils from cultivated *Lavandula angustifolia* and *Matricaria chamomilla*, and commercial products in Bulgaria. A large variability in the chemical composition of the commercial samples of the studied essential oils was found, which would inevitably have an impact on the quality of the final product.

Ch. assist. prof. Paolina Lukova-Katsarova, PhD

1. Habilitation thesis – monograph

In the current competition, Dr. **Paolina Lukova-Katsarova** participates with a monograph entitled: „Polysaccharide Microvehicles for Drug Delivery”. 2023. Publisher: Lax Book. ". ISBN 978-619-04-0029-5, Authors: Plamen Katsarov and Paolina Lukova.

2. Scientific publications

Dr. **Paolina Lukova-Katsarova** applied for participation in the current competition 34 scientific publications, including 18 with an impact factor and 3 chapters from a collective monograph. **Original articles are 27** (14 in journals with impact factor). **Review articles are 4** (№ 13, 14, 22 and 23). 27 of the presented scientific articles are in English and 7 (№ 23, 26, 27, 28, 29, 30 and 31) are in Bulgarian. There are no publications duplicated in the author's abstract for PhD thesis. The total impact factor of the presented publications is **70.481**. The total number of citations of the candidate is 278, including 238 in scientific publications, referenced and indexed in Scopus. H-index (Scopus) = 7. A total of 21 publications are in the field of pharmacognosy and phytochemistry, while 12 of them (3, 5, 6, 8, 13, 14, 19, 20, 21, 22, 32 and 34) are in the field of drug technology.

3. Scientific contributions

The main scientific contributions of Dr. **Paolina Lukova-Katsarova** are in the field of pharmacognosy and phytochemistry and drug technology, with focus on the isolation and structural characterization of polysaccharides from marine algae and higher plants, enzymatic modification of natural polysaccharides, research on the biological activities of polysaccharides from higher plants and marine algae and the use of natural polysaccharides as medicinal carriers. The candidate is as an established specialist in the field of polysaccharides and their practical application in pharmaceutical practice.

According to the presented reference, the scientific contributions of **Dr. Paolina Lukova-Katsarova** can be considered in three main directions:

3.1. Isolation and structural characterization of polysaccharides from marine algae and higher plants - analysis of the chemical composition and structure of fucoidan by *C. crinita*, distributed in the Black Sea was performed. The amount of total neutral sugars, organic acids and sulfate groups were determined spectrophotometrically. Alginate from *C. crinita*, obtained from the Bulgarian Black Sea was isolate. For the first time, an analysis of the chemical composition and structure of polysaccharides from the leaf of *P. major*, distributed in Bulgaria was performed.

3.2. Enzyme modification of natural polysaccharides - the process of enzyme hydrolysis of polysaccharides from the leaves of *Plantago major* was carried out to obtain low-molecular fractions of oligosaccharides. Direct enzymatic extraction of leaves from *P. major*, *P. media* and *P. lanceolata* was carried out to obtain extracts containing both polyphenols and low molecular weight polysaccharides. The monosaccharide and oligosaccharide composition of the hydrolysis products is analyzed by high-performance liquid chromatography (HPLC) with a refractometric detector.

3.3. Investigation of the biological activities of polysaccharides from higher plants and seaweed and the use of natural polysaccharides as drug vehicles-the candidate's studies in this topic are aimed at studying the biological activities of polysaccharides, as well as their low-molecular fractions, with the aim of their potential use as therapeutic molecules. Determination of prebiotic, antioxidant, anti-inflammatory and immunomodulatory activity was carried out.

Both candidates participate in the current competition with **9 common (same) publications**, **6** in scientific publications, refereed and indexed only in Scopus and/or Web of Science and **3** in non-refereed journals with scientific review or published in edited collective volumes.

I evaluate highly the scientific and research activity of both candidates.

IV. Conformity assessment of the minimum required points by groups of indicators.

Comparative Table of MANDATORY MINIMUM SCIENTOMETRIC INDICATORS OF MU-PLOVDIV FOR PROFESSIONAL FIELD 7.3. PHARMACY of ch. assistant Diana Karcheva-Bahchevanska, PhD and ch. assistant Paolina Lukova-Katsarova, PhD.

Group	Indicators	Minimum points for Associate Professor	Points of ch. assistant Diana Karcheva-Bahchevanska, PhD	Points of ch. assistant Paolina Lukova-Katsarova, PhD
A	1. PhD thesis	50	50	50
C	3. Habilitation thesis - monograph	100	100	100
D	7. Publications and reports published in scientific editions, refereed and indexed in world-renowned databases of scientific information		217.43	187.09
	8. Publications and reports published in non-refereed peer-reviewed journals or published in edited collective volumes		121	138.50
	9. Published chapter of a collective monograph			4.25
Total:		210	<u>338.43</u>	329.84
E	10. Citations or reviews in scientific editions refereed and indexed in world-renowned databases of scientific information or in monographs and collective volumes		1 530	3 570
	11. Citations in monographs and collective volumes with scientific peer reviewed		50	30
	12. Citations or reviews in non-refereed peer-reviewed journals		180	185
Total:		300	1 760	<u>3 785</u>
F	15. Obtained medical specialty		40	40

	16. Participation in a national scientific or educational project		165	105
	18. Management of a national scientific or educational project		30	
	21. Published university textbook or a textbook used in the school		13.34	
	22. Training of interns, specialists and PhD students (seminars and practical classes)		30	
Total:		50	<u>278.34</u>	145
G	Educational horarium (lectures and practical classes):	360	<u>1 069</u>	783
	Academic position:	200	483.33	483.33*
Total:		1270	4079.10	<u>5692.84</u>

*both candidates have the same work experience as a chief assistant (4 years, 10 months and 11 days), so I reduce the points for this indicator of ch. assistant Paolina Lukova-Katsarova, PhD from 500 to 483.33.

According to the applied materials for the competition, I think that **both candidates fully correspond to the minimum requirements** for the academic position "associate professor" defined by the Regulations for the conditions and procedures for acquiring scientific degrees and occupying academic positions of MU-Plovdiv.

According to the Regulations for Academic Development at MU-Plovdiv, art. 111 (2): In case of equal conditions in art. 1 the scientific jury takes into account and evaluates the candidates also according to the following additional indicators:

1. related to the educational activity:

a) auditoria and extrauditoria classes; development of lecture courses, innovations in teaching methods, implementation of activities in a practical environment in and outside the MU-Plovdiv;

c) work with students and PhD students, including work with students and PhD students in research and artistic projects;

d) participation in expert and examination committees;

2. related to Scientific-Research Activity:

b) participation in research projects; participation with reports at international and national forums; membership in authoritative creative and/or professional organizations in the relevant scientific field;

Indicators	ch. assistant Diana Karcheva-Bahchevanska, PhD	ch. assistant Paolina Lukova-Katsarova, PhD
1 a) Auditoria horarium + Scientific activity + Extra-auditoria horarium for the last two years (According to the Academic Reference)	<u>3 065.54 school hours</u>	2 251 school hours
1 c)	Yes	Yes

1 d)	Yes	Yes
2 b)	Yes	Yes

Conclusion:

After consideration of the applied documents, I think that **both candidates fully correspond to the minimum requirements** for the academic position "associate professor" defined by the Regulations for the conditions and procedures for acquiring scientific degrees and occupying academic positions of MU-Plovdiv.

Ch. assist. prof. **Diana Karcheva-Bahchevanska**, PhD participates in the current competition with more points at the indicators D, F and G, while ch. assist. prof. **Paolina Lukova-Katsarova**, PhD participates with more points only at the indicator E. Ch. assist. prof. **Diana Karcheva-Bahchevanska**, participates with more school hours of auditoria and extra-auditoria horarium for the last two years, which is taken into account in accordance with the Regulations for Academic Development at MU-Plovdiv, art. 111 (2).

Based on the above mention, I recommend to the respected members of the scientific jury to award to ch. assis. prof. **Diana Karcheva-Bahchevanska**, PhD the academic degree "Associate professor" in the Higher education area 7. Healthcare and sports, professional field 7.3. Pharmacy, in the scientific specialty "Pharmacognosy and phytochemistry" of the Department "Pharmacognosy and Pharmaceutical Chemistry"

In addition, I recommend to the Departmental Council of the Department "Pharmacognosy and Pharmaceutical Chemistry" at the Faculty of Pharmacy of MU-Plovdiv to announce one more procedure for obtaining the Academic degree "**Associate professor**" in the Higher education area 7. Healthcare and sports, professional field 7.3. Pharmacy, in the scientific specialty "**Pharmacognosy and phytochemistry**".

16.12.2023

Opinion prepared by:

Assoc. Prof.  Dimitrina Zheleva-Dimitrova, PhD