

REVIEW

From: Associate Professor Iliya Zhelev Slavov, Ph.D.

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Regarding: submitted documents for the competition for the academic position of **Associate Professor** at the Faculty of Pharmacy, Medical University of Plovdiv
in the field of higher education 7. Healthcare and Sport,
professional direction 7.3. Pharmacy,
scientific specialty: Pharmacognosy and Phytochemistry

I am appointed by the order of the Rector of the Medical University of Plovdiv No. R-3080/24.10.2023 as a member of the scientific jury, in a competition for the academic position of 'associate professor,' announced in the State Gazette No. 59/11.07.2023, for the needs of the Department of Pharmacognosy and Pharmaceutical Chemistry at the Faculty of Pharmacy, Medical University of Plovdiv.

At the first meeting of the Scientific Jury on 06.11.2023, I was authorized as a reviewer for a competition.

The competition involves two candidates: **Chief Assistant Diana Petrova Karcheva-Bahchevanska, Ph.D.**, and **Chief Assistant Paolina Kuncheva Lukova-Katsarova, Ph.D.**

The documents presented by the candidates comply with the Regulations for the terms and procedures for acquiring scientific degrees and occupying academic positions at the Medical University of Plovdiv, as follows:

1. Application to the Rector of the Medical University of Plovdiv for participation in the competition with a list of documents.
2. Autobiography in European format (CV), signed by the candidate.
3. A copy of Diploma for higher education with an appendix (notarially certified).
4. A copy of the Diploma for obtaining a Ph.D. in the scientific speciality of the announced academic position (notarially certified).
5. Certificate of professional experience in the respective speciality and a statement of the academic positions held to date.
6. Academic statement of the candidate's teaching workload – according to a template from the Medical University of Plovdiv's website, certified by the Head of the "Educational Activities" department for the last three academic years.
7. Statement of research workload (if any).
8. A copy of the latest Attestation.
9. Abstract of the doctoral dissertation.
10. Habilitation thesis – monograph or scientific publications (no less than 10) in journals that are referenced and indexed only in Scopus and/or Web of Science.
11. Published monograph not presented as the main habilitation work (if any).
12. Published book (with ISBN) based on the defended doctoral dissertation for obtaining a Ph.D. (if any).
13. List of publications in scientific journals, referenced and indexed only in Scopus and/or Web of Science.
14. List of publications in non-referenced journals with scientific peer-review or published in edited collective volumes (if any).
15. Published chapter from a collective monograph (if any).
16. List of citations and/or reviews in scientific journals, referenced and indexed only in Scopus and/or Web of Science with supporting materials from databases.
17. List of citations in monographs and collective

volumes with scientific peer-review (if any). 18. List of citations and/or reviews in non-referenced journals with scientific peer-review (if any). 19. Copies of diploma/s for recognised specialty/ies (notarially certified). 20. Document/s proving participation in a national scientific or educational project (certificate from the funding institution or a copy of the contract, etc.), if any. 21. Document/s proving participation in an international scientific or educational project (if any). 22. Document/s proving leadership of a national scientific or educational project (if any). 23. Document/s proving leadership of an international scientific or educational project (if any). 24. Published university textbook (if any). 25. Published university educational aid (if any). 26. Documents certifying the training of interns, specialists, and PhD students, issued by the respective department/chair of the higher education institution/scientific organisation (if any). 27. Report on original scientific contributions with supporting material. 28. Self-assessment report according to a template for meeting the specific scientometric requirements in the main units of the Medical University of Plovdiv. 29. Declaration of originality and authenticity of the submitted documents, according to a template.

Since there are two candidates for the competition, they will be reviewed and evaluated in the order they were initially mentioned.

Chief Assistant Diana Petrova Karcheva-Bahchevanska, Ph.D., completed her higher education at the Medical University of Plovdiv in 2012 with a master's degree in pharmacy. She successively held the positions of assistant (2012 – 2018) and chief assistant (2018 – to date) in the Department of Pharmacognosy and Pharmaceutical Chemistry, Faculty of Pharmacy at the Medical University of Plovdiv. She enrolled as a doctoral student in Pharmacognosy and Phytochemistry in the same department in 2016, after which she successfully defended her doctoral thesis on the topic *'Study of the functional properties of polyphenol extracts from species of the genus Vaccinium L. on carbohydrate metabolism enzymes'* in 2018. The candidate specialises in 'Medicinal Plants and Phytopharmaceutical Products,' acquired in 2019.

After Diana Petrova Karcheva-Bahchevanska defended her Ph.D. in 2018, she occupied the academic position of 'Chief Assistant' (a requirement of at least two academic years of experience as per the regulations of the Medical University of Plovdiv).

The scientific production presented by the candidate and its scientometric characteristics regarding the additional and recommended criteria of the Faculty of Pharmacy at the Medical University of Plovdiv are as follows:

- The candidate participated with 20 publications in scientific journals, referenced and indexed in Scopus and/or Web of Science (Group G7) with a total number of points from the publications - 217.43.
- From this group of publications, I consider that publication number 4 is unrelated to the competition's subject area (topic related to the analysis of synthetic products). Therefore, I reckon it should not be scored.

After reducing the points in this group, they amount to 205.43.

- The candidate also presents ten publications in non-referenced journals with scientific peer-review (Group G8) with a total number of 121 points.

The main contributions in the presented scientific works can be systematised in the following three thematic directions:

I. Isolation and Characterization of the Component Composition of Essential Oils from Various Plant Sources.

The candidate's research in this thematic area is focused on isolating essential oils from various medicinal and aromatic plant species (*T. macrophyllum*, *Lavandula angustifolia*, *Cardaria draba*) and characterising them in terms of chemical composition using gas chromatography-mass spectrometry (GC-MS). Histochemical analysis has been conducted to establish and demonstrate the localisation of lipophilic compounds in the respective secretory containers in *Echinophora tenuifolia* subsp. *sibthorpiana* and *Rhaponticum carthamoides*. Additionally, the acute and subacute toxicity of essential oil from *Tanacetum vulgare* L. and *Tanacetum parthenium* L. has been assessed. The ultimate goal is to understand better the relationship between the chemical composition and the presence or absence of toxicity in the components of the essential oils, which could contribute to their new applications in the fields of human health, agriculture, and environmental protection.

II. Extraction of Primary (Polysaccharides) and Secondary Metabolites (Phenolic Compounds) from the Genera *Plantago* and *Vaccinium* and Investigation of Their Biological Activity.

The candidate's research in this thematic direction is focused on the isolation and analysis of polysaccharides from three species of the genus *Plantago* and the investigation of their biological activities. Additionally, it involves isolating and analysing phenolic compounds from the genus *Vaccinium* and studying their biological activities. Notably, for the first time, the inhibitory effect of extracts from fruits of *Vaccinium myrtillus* L., common in Bulgaria, on the key enzyme α -amylase has been investigated.

III. Development and Validation of Methods for Gas Chromatography-Mass Spectrometry and High-Performance Liquid Chromatography for Quality Control of Food Supplements.

In response to the demonstrated need for rigorous analytical control of dietary supplements and identified discrepancies between the labelling of dietary supplements and their qualitative and quantitative content, a GC-MS method has been developed. This method ensures reliable and efficient screening for sibutramine in dietary supplements. Additionally, a reverse-phase HPLC method has been proposed, which can be used for the identification and quantitative determination of ecdysterone and turkesterone, both individually and simultaneously, in dietary supplements as well as in plant extracts. Through these developed methods, a generally higher safety and quality of dietary supplements containing these bioactive substances can be ensured, along with a reduction in their side effects.

The scientific contributions presented in the articles with which the candidate participates in the competition can be assessed in the provided report as follows: 92 citations in journals referenced and indexed in Scopus and/or Web of Science (92 x 15 points = 1380 points), eight reviews of scientific articles in referenced scientific journals (8 x 15 = 120 points), five citations in monographs and collective volumes with scientific peer-review (5 x 10 = 50 points), and 36 citations in non-referenced journals with scientific peer-review (36 x 5 = 180 points).

In conclusion, it should be noted that the citations of the candidate's publications far exceed the requirements for the position of 'Associate Professor,' as set out in the regulations of the Medical University of Plovdiv.

Diana Petrova Karcheva-Bahchevanska presents a monograph on the topic '*HPTLC - Application and Possibilities in the Analysis of Substances of Plant Origin*' (118 pages), presented in 6 sections.

The monographic work focuses on the theoretical and practical aspects of the applications of a modern and universal analytical apparatus like the HPTLC system, especially emphasising its capabilities in the analysis of substances of plant origin. The advantages offered by HPTLC are presented, compared to other widespread chromatographic techniques: the possibility for simultaneous analysis of multiple samples, fewer restrictions regarding the nature of the analytes, more options in the analysis of plant extracts, absence of interaction of the stationary phase with analytes from previous analyses, etc. The provided theoretical and technical information, as well as the practical focus of the monographic work, would assist in conducting reliable and reproducible HPTLC analysis to determine the identity, purity, and quality of plant raw materials, extracts, and other intermediate products, as well as finished phytoproducts.

Overall, the monographic work is a valuable source of systematised information on the topic and can be used by students, teachers, researchers, and independent laboratories.

Chief Assistant Diana Petrova Karcheva-Bahchevanska has participated in a total of 12 projects - 2 national projects under the Scientific Research Fund and ten projects of the Medical University (of which she is the leader in one).

The candidate presents information about her participation in international and national scientific forums, respectively: 2 international and 4 national scientific forums.

The teaching work of Chief Assistant Diana Petrova Karcheva-Bahchevanska is related to the profiling educational discipline for the speciality Pharmacy - Pharmacognosy, as well as the related initial organisation of auditorium and extra-auditorium activities - new curricula, a system for continuous control and assessment, practical training in Pharmacognosy, creation and maintenance of educational collections, preparation of materials for pre-graduate internship. The candidate is also the author of the protocol notebook in Pharmacognosy – Parts I and II.

Chief Assistant Karcheva-Bahchevanska, Ph.D., actively leads educational activities in the speciality, with a teaching workload for the last three years far exceeding the required amount. She is the leading lecturer and the only teacher in the practical training of students in English language education during this period.

She has also been the supervisor of an intern under the Erasmus+ program (Mathias Bon from Polytech Clermont, France) for four months.

Among the documents showing the candidate's engagement are also orders from the Medical University of Plovdiv for her participation in the examination commission in

competitions for the academic position of 'Assistant' and non-academic position of 'Teacher'; Order for participation in a commission for conducting colloquiums on modules from a speciality in the healthcare system: 'Medicinal Plants and Phytopharmaceutical Products'; Order for participation in a commission during the competition exam for a regular doctoral student in 'Pharmacognosy and Phytochemistry';

A certificate for the best exercise lecturer for the winter semester of 2021/2022, issued by the University Quality Commission and the Student Council, also makes a good impression;

The presented documents clearly show the active participation of Chief Assistant Diana Petrova Karcheva-Bahchevanska as an active member of the department to which she belongs – she is not only an administrative officer but also responsible for introducing and registering documents from the unit in the document management system EVENTIS R7.

The candidate is a member of the Bulgarian Pharmaceutical Society and the 'Phytochemical Society of Europe'.

The second candidate for the competition is:

Chief Assistant Paolina Kancheva Lukova-Katsarova, Ph.D. - She also completed her higher education at the Medical University of Plovdiv in 2012, specialising in Master of Pharmacy. She successively held the positions of Assistant (2012 - 2018) and Chief Assistant (2018 - to date) in the Department of Pharmacognosy and Pharmaceutical Chemistry, Faculty of Pharmacy at the Medical University of Plovdiv, thereby also meeting the two-year experience requirement stipulated in the rules of the Medical University of Plovdiv. She enrolled in the same department as a Ph.D. student in Pharmacognosy and Phytochemistry. In 2018, she successfully defended her doctoral thesis on '*Investigation of the Prebiotic Potential of Polysaccharides in Certain Species of Plantago L., Widespread in Bulgaria*'. In the same year, she acquired a speciality in 'Medicinal Plants and Phytopharmaceutical Products.'

The scientific production and scientometric characteristics presented by the candidate Paolina Kancheva Lukova-Katsarova are as follows:

- The candidate presents 18 publications in scientific journals, referenced and indexed in Scopus and/or Web of Science, with a total number of points from the publications - 187.09.

Of these publications, the themes of articles number 1, 2, 3, 6, 7, 8, and 14 stand out strongly, being directed towards areas different from the current competition.

For some of them, such as 2, 3, and 8, the appropriate direction in which they should participate in the competition is Pharmaceutical Technology. For others, like 1, 6, and 7, there is primarily a technological theme with only a mention of natural substances without a phytochemical part. Article 14 has a theme in the field of Pharmacology. For this reason, I consider it is not appropriate to score them in the current competition.

After reducing the points in Group G7 by 95.45 points (the sum of the above-mentioned articles), the points amount to 91.64.

- The candidate presents 13 publications in non-referenced journals with scientific peer-review (Group G8), with a total of 138.5 points.

Among them, publications number 2, 3, and 4 are outside the theme of the competition and should not be scored. These works are in the field of pharmaceutical technology, and in the field of pharmacognosy, individual facts were discussed.

As a result of the above, from Group G8, the points from publications 2, 3, and 4 (a total of 47.5 points) should be deducted.

After the reduction of points, the total number of points in Group G8 is 91 points.

The main contributions in the presented scientific works can be systematised in the following thematic directions:

I. Isolation and Structural Characterization of Polysaccharides from Marine Algae and Higher Plants.

The candidate's research in this thematic direction is focused on optimising methods for extracting and characterising polysaccharides of natural origin - fucoidan and alginates from brown algae and polysaccharides from representatives of the genus *Plantago*.

Marine algae are an exciting and promising object of study with potential for use as functional foods, dietary supplements, and even medicinal products. The great diversity of species and their ability to synthesise primary and secondary metabolites specific to them, as well as their unlimited natural resource (as raw material), lead to increased interest in their use. In the articles presented by the candidate, reports on the isolation and purification of fucoidan and alginates from brown algae of the species *Cystoseira crinita*, sourced from the Black Sea, are mentioned, as well as the quantitative determination of bioactive substances in the substance. The studies on different species of plantain (*Plantago*) report on the conducted pharmacognostic analysis and the analysis (isolation and characterisation) of polysaccharides in the leaves of various species of the genus.

II. Enzymatic Modification of Natural Polysaccharides.

Here, the studies are focused on low molecular weight fractions of plant polysaccharides and the variety of their biological activities and applications. A method for their production has been selected - the enzymatic catalysis of polysaccharides, as it leads to the obtaining of oligosaccharides with desired molecular mass and chemical composition. This method has been applied to polysaccharides from the leaves of *Plantago major* for the production of low molecular weight oligosaccharide fractions.

III. Investigation of the Biological Activities of Polysaccharides from Higher Plants and Marine Algae.

The candidate's research in this thematic direction is directed towards investigating the biological activities of a major group of primary metabolites – polysaccharides and their low molecular weight fractions, with the aim of their potential use as prebiotics, antioxidants, and natural agents with anti-inflammatory and immunomodulatory activity.

IV. Utilisation of Natural Polysaccharides as Drug Carriers.

The theme in this direction differs from that of the competition because it primarily involves a literature study information on the potential use of various types of polysaccharides as medicinal carriers and would have significance in a competition in the direction of Pharmaceutical Technology.

The significance of the scientific contributions presented in the articles with which the candidate participates in the competition is evident from the provided report of 238 citations and reviews, referenced and indexed in Scopus and Web of Science (238 x 15 points = 3570 points), 37 citations and reviews in non-referenced journals with scientific peer-review (37 x 5 = 185 points), three citations in monographs and collective volumes with scientific peer-review (3 x 10 = 30 points).

Notably, one of the publications has been cited more than 100 times in publications referenced and indexed in Scopus and Web of Science.

This is publication 14: Apostolova E, Lukova P, Baldzhieva A, Katsarov P, Nikolova M, Iliev I, Peychev L, Trica B, Oancea F, Delattre C, Kokova V. Immunomodulatory and anti-inflammatory effects of fucoidan: A review. *Polymers*. 2020; 12(10): 2338.

This publication accounts for 1515 points from group D10.

As mentioned before, this publication is entirely significant in the field of Pharmacology, and the theme includes general characteristics of bioactive substances without any phytochemical part.

For this candidate, too, the citations of the publications far exceed the requirements for the position of Associate Professor, as set out in the regulations of the Medical University of Plovdiv.

The candidate Chief Assistant Paolina Kuncheva Lukova–Katsarova presents a monographic work on the topic: '*Polysaccharide Microcarriers for Drug Delivery*' in co-authorship with Plamen Katsarov (with a volume of 266 pages).

The monograph is divided into two parts, with the candidate presented as the author of Part 2 in the work entitled: '*Polysaccharides for Obtaining Microparticles*', starting from page 123.

According to Art. 108, item 10 of the Rules for the Development of the Academic Staff at the Medical University of Plovdiv, the candidate submits either a monographic work or ten articles different from the ones submitted for the competition.

The part of the monograph in which Chief Assistant Paolina Kuncheva Lukova–Katsarova is the author includes information presented in the translation of articles, results, tables, and figures which she has already presented for participation in the competition. The differences are that the article is written in English, while the monograph is in Bulgarian, or it creates the impression that the candidate is presenting the same results twice in the competition.

A significant omission is the absence of a detailed protocol for the significance each of the two authors has in writing the monograph. This is necessary according to point 5 in the Notes to the Rules for the Application of LDAS in the RB. Because the theme and title of the work imply information mainly in the field of Pharmaceutical Technology, the question of the candidate's role in writing it remains unclear.

Additionally, it should be noted that Paolina Kuncheva Lukova–Katsarova has also presented three published chapters in collective monographs.

The candidate's work in project activity is presented with participation in a total of 7 projects (4 national scientific projects, 1 of which is under the Scientific Research Fund, and three educational projects with European funding).

Distribution of participation in scientific forums is, respectively, in 11 international and 13 national scientific forums.

The teaching work of Paolina Kuncheva Lukova-Katsarova, like the previous candidate, is related to the profiling educational discipline for the speciality Pharmacy - Pharmacognosy and the related organisation of auditorium and extra-auditorium activities. A document for her appointment as an administrative officer is also attached.

The candidate, Chief Assistant Lukova–Katsarova Ph.D. has led educational activities in the speciality, and for the last three years, she has not had a teaching workload due to maternity leave.

Documents showing the candidate's commitment before the mentioned period are included: participation in examination committees in competitions for academic positions; participation in commissions for conducting colloquiums on speciality modules; participation in examination commissions for the disciplines 'Pharmacognosy Part I' and 'Part II' and English-language training; participation in an expert group for a check under a program accreditation procedure of a doctoral program.

The candidate is a member of GA - Society for Medicinal Plant and Natural Product Research; - American Society of Pharmacognosy; - Youth Scientific Society 'Asclepius'.

Conclusion:

The documents and materials presented by both candidates meet the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (LDAS), the Regulations for the Implementation of LDAS, and fully cover and exceed multiple times the requirements of the Medical University of Plovdiv for acquiring the academic position of 'associate professor'.

As a final decision based on the analysis of the overall activity (research, teaching, project, expert) of the two candidates and their overall preparation for the competition, I consider that:

- the candidate **Chief Assistant Diana Petrova Karcheva-Bahchevanska, PhD**, is more qualified and with her contributions to the field of Pharmacognosy and Phytochemistry, fully meets the announced direction of the competition and presents the candidate as a serious scientist and established teacher. The serious teaching workload over the last three academic years should not be overlooked, which is why she has accumulated the necessary practical experience and theoretical knowledge for the level of a habilitated lecturer (associate professor).

As a result of the above, I recommend that the Scientific Jury of the competition votes positively for the selection of **Diana Petrova Karcheva-Bahchevanska** and proposes to the Faculty Council of the Faculty of Pharmacy at the Medical University of Plovdiv that she be elected to the academic position of 'associate professor' in Pharmacognosy and Phytochemistry in professional direction 7.3. Pharmacy.

18. 12.2023
Varna

Заличено на основание
Чл.5 §1, 6."В" Регламент (ЕС)2016/679

Reviewer: ..
/Associate Professor Iliya Zhelev Slavov, Ph.D./