

OPINION

from prof. Ginka Atanasova Antova, PhD,
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on the materials submitted for the competition
for the academic position of "Associate Professor"
at University of Plovdiv „Paisii Hilendarski“

in Area of higher education: 4. Natural sciences, mathematics and informatics
Professional field: 4.2. Chemical sciences (Organic chemistry, Chromatographic analysis).

In the competition for ‘associate professor’, announced in the State Gazette, issue 39 of 02.05.2023, and on the website of University of Plovdiv „Paisii Hilendarski“ for the needs of the Department of Organic Chemistry at the Faculty of Chemistry as a candidate applied Chief assistant professor Dimitar Georgiev Bozhilov, PhD from the department Organic chemistry.

1. General presentation of the procedure and the candidate

By order № RD-21-1425 of 30.06.2023 of the Rector of the University of Plovdiv "Paisii Hilendarski" (PU) I have been appointed as a member of the scientific jury of a competition for the academic position of “associate professor” in the PU in area of higher education 4. Natural sciences, mathematics and informatics, professional field 4.2 Chemical Sciences (Organic Chemistry, Chromatographic Analysis), announced for the needs of the Department of Organic Chemistry at the Faculty of Chemistry.

The only a candidate who has submitted documents for participation in the announced competition is Chief assistant professor, Dimitar Georgiev Bozhilov, PhD from the department Organic chemistry, Faculty of Chemistry at University of Plovdiv „Paisii Hilendarski“.

The set of materials presented by Chief assistant professor Dimitar Georgiev Bozhilov, PhD on an electronic media is in accordance with the Regulations for the Development of the Academic Staff of the PU, and includes all the necessary documents.

The candidate has presented a total of **35** scientific publications, **24** of them are in journals referenced and indexed in Scopus and Web of Science and **11** in journals not referenced in the two scientific databases. The candidate Chief assistant professor Dimitar Georgiev Bozhilov, Ph.D., participated in the competition for the academic position of "associate professor" with **24** scientific papers, **7** of them are presented as an equivalent number of articles for a habilitation work (indicator C), and the remaining **17** are according to a group of indicators "D". The distribution of scientific papers on the respective Q factors is as follows: articles with Q1 - a total of 6, with Q2 - 2, with Q3 – 4 and with Q4 -12. After achieving the academic position of "chief assistant professor" he has participated in 76 conferences, 11 of which were international, held abroad. He has participated in 9 scientific projects, 5 of which are national at the Scientific Research Fund of the Ministry of Education and Science. He was the head of 1 project financed by the Scientific Research Fund at the PU "Paisii Hilendarski".

Chief assistant professor Dimitar Bozhilov graduated in 2004 with a bachelor's degree in “Meat and milk technology” at the University of Food Technology, Plovdiv, in 2008 with a bachelor's degree in "Computer Chemistry" and in 2009 with a master's degree in “Organic chemistry” at the

University of Plovdiv. In 2017, he defended a dissertation for the Educational and Scientific Degree "Doctor" in the doctoral program "Organic Chemistry".

2. General description of the candidate's work

Evaluation of educational and pedagogical activities

MSc Bozhilov has been an assistant on a basic contract in the Department of Organic Chemistry of University of Plovdiv "Paisii Hilendarski" since 2013, and since February 2018 he has been the chief assistant professor in the same department. His work experience in the academic position of chief assistant is 5 years, 3 months and 20 days as of 06/20/2023. He led exercises for Bachelor and Master students in the disciplines "Bioorganic Chemistry", "Organic Chemistry", "Modern Chromatographic Methods", "Chemistry of Narcotic Substances", "Organic Analysis", "Chromatographic Analysis", "Analysis of Medicinal substances part II", "Organic analysis, mass spectrometry", "Chromatographic methods in pharmaceutical analysis" and "Phytochemistry of medicinal plants". His academic work also includes conducting lectures on the disciplines "Bioorganic Chemistry", "Chromatographic Analysis", "Analysis of Medicinal Substances Part II", "Chromatographic Methods in Pharmaceutical Analysis" and "Phytochemistry of Medicinal Plants". He also leads lectures, seminars and exercises on disciplines from the Postgraduate course "High Performance Liquid Chromatography".

He is the author of 4 study programs in the disciplines "Chromatographic methods in pharmaceutical analysis" and "Phytochemistry of medicinal plants" for the Master's program "Pharmaceutical Chemistry", full-time and part-time studies. An indicator of his qualities as a teacher is also his active work with students, as for the period 2019-2022 he was the supervisor of 13 graduates, of whom 9 successfully defended their Bachelor's degrees and 4 were students from Master's programs "Medicinal Chemistry" and "Pharmaceutical Chemistry".

Evaluation of the scientific activity

In the competition for "associate professor" Chief assistant professor Dimitar Bozhilov, PhD participates with a total production of **24** scientific publications, grouped as follows:

- *Publications in scientific journals equivalent to a habilitation work* - **7** publications, **6** of which are in journals with an *impact factor* (*Plant physiology and biochemistry* with IF=2.718 with quartile Q1, *Journal of food science and analysis* with IF = 4.05 with quartile Q1, *Czech. journal of food science* with IF = 1.279 with quartile Q3, *Turkish journal of agriculture and forestry* with IF = 2.585 with quartile Q1, *ACS Omega* with IF = 4.132 with quartile Q1 and *Molecules* with IF = 4.927 with quartile Q1) and **1** is in a journal with impact rank (*Bulgarian journal of agricultural science* with SJR=0.25 with quartile Q3);

- *Publications in publications that are referenced and indexed in world-renowned databases* – **17** publications, **8** of which are in journals with an *impact factor* (1 in the journal *Molecules* with IF=4.927 with Q1, 2 in the journal *Processes* with IF=3.5 with Q2, 1 in *Journal of the Serbian Chemical Society* with IF=1.1 with Q3 and 4 in *Molbank* with IF=0.6 with Q4), **1** in journal with *impact rank* (in *Oxidation communication* with SJR=0.213 with Q3) and **8** in journals with *impact rank* (SJR) (3 in *Bulgarian chemical communications* and 5 in *Molbank*).

All publications submitted for the competition are in English and are in referenced and indexed journals. The results presented in the publications are a collective development, as in 3 of the publications Chief assistant professor Bozhilov is the first author, in 1 he is a second author, in 15 he is a third author, in 4 he is a fourth and in 1 he is a seventh author.

- Citation of scientific production

The candidate has worked purposefully, has accumulated significant results, which he has made available to a wide audience and has received recognition from a number of scientists abroad. The total number of citations presented for the period 2013 - 2023 is **130**, of which **103** are in refereed journals (Scopus/Web of Science), **16** in specialized journals, **8** in foreign dissertations and **3** in foreign Master's theses). Chief assistant professor Bozhilov has an h-index of 6.

Chief assistant professor Dimitar Bozhilov, Ph.D., has met the national minimum requirements and the requirements of the Regulations for the Development of the Academic Staff of the "Paisii Hilendarski" PU, and even for indicators C, D and E, he has exceeded the required points of the national minimum requirements of the Regulations for application of the Academic Staff Development Act of Republic of Bulgaria. The points indicated for each indicator are described in detail and are supported by evidence.

Compliance with national minimum requirements
in a professional field 4.2. Chemical sciences

Group of indicators	A	B	C	D	E	Total
National minimum requirements	50	–	100	200	50	400
Achievement	50	–	155	215	206	626

Main contributions

The scientific activity of Chief assistant professor Dimitar Bozhilov, PhD, is in the field of organic chemistry and phytochemistry of medicinal plants. According to the presented scientific works of the candidate, it can be seen that the main contributions have a scientific and scientific-applied nature. The contributions from scientific work are mainly grouped in the following areas:

1. Development and optimization of chromatographic conditions in order to obtain a *fingerprint* of the polyphenolic complex of a number of medicinal plants. The polyphenolic complex was analyzed and the polyphenolic components were identified using HPLC-PDA and UHPLC-MS/MS methods. The polyphenol complex of *Habarella rhodopensis*, *Chenopodium botrys*, *Vernonia amygdalina*, *Rosa damascena* and *Lactuca* spp (*Lactuca sativa* *Batavia* cv. *Maritima*, *Lolo rosa* cv. *Tuska* and cv. *Winter Butterhead*) was investigated by HPLC-PDA. The relationship between different fertilization practices and the polyphenol composition of three types of lettuce (*Lactuca* spp) was investigated and it was found that the application of different fertilization practices affects the polyphenol content. The identified components of the polyphenolic complex of the chloroform and ethyl acetate fractions of *Habarella rhodopensis*, *Vernonia amygdalina*, *Rosa damascena* and *Chenopodium botrys* were confirmed by the mass spectral data obtained using the UHPLC-MS/MS method. The use of combined techniques such as HPLC-PDA and UHPLC-MS facilitates the identification and structure elucidation of biologically active compounds.

2. Study the composition of essential oils of two species of *Nepeta* - *Nepeta transcaucasica* and *Nepeta cataria*. It was established that the composition of both oils is dominated by oxygen-containing monoterpenes.

3. Research *in vitro* biological activity

The antioxidant activity of the essential oil of two species of *Nepeta* (*Nepeta transcaucasica* and *Nepeta cataria*) and *Helichrysum italicum*, of the fractionated polyphenolic complex of *Chenopodium botrys* and of 7 species of wild growing edible mushrooms (*Boletus pinophilus*, *Can-*

tharellus aurora, *Cantharellus tubaeformis*, *Cantharellus cibarius*, *Craterellus cornucopioides*, *Morchella esculenta* and *Tricholoma equestre*) was investigated.

The anti-inflammatory and anti-arthritis activities of a fractionated polyphenol composition from *Chenopodium botrys* were also investigated. It has been established that the extracts of the studied plants can be used in the development of new pharmaceutical products with medical and pharmacological applications.

4. Synthesis, analysis and biological activity of new organic compounds

New biofunctional hybrid molecules and sulfone amides have been synthesized, which are characterized by significant antioxidant, anti-inflammatory and anti-arthritis activity. A mass spectral analysis of variously substituted 2-phenylethylamines and their cyclic analogs, as well as tryptamine hybrid molecules with a different prophen residue, was performed. It is suggested that the newly synthesized compounds may be reliable and effective components of medicinal preparations.

The publication of the research results in specialized renowned journals, their popularization at international conferences and his participation in national projects are recognition of the professional qualities of the candidate as a researcher. The recognition of Chief assistant professor Bozhilov, in the scientific circles in our country and abroad is confirmed by the large number of citations by foreign authors for the period 2013 - 2023.

3. Critical remarks and recommendations

I have no critical remarks and recommendations to the candidate.

CONCLUSION

The scientific data and presented materials from Chief assistant professor Dimitar Georgiev Bozhilov, PhD, **meets all** the requirements of the of the Academic Staff Development Act of Republic of Bulgaria (ASDARB), the Implementation Regulations of the ASDARB and the requirements of the Regulations for the Development of the Academic Staff of PU "Paisii Hilendarski".

The candidate in the competition has submitted a sufficient number of scientific works, published after the materials used in the defence of the Educational and Scientific Degree "doctor", in which there are original scientific and scientific-applied contributions. The scientific and teaching qualifications of Chief assistant professor Dimitar Georgiev Bozhilov are unquestionable.

The results achieved by assistant professor Dimitar Georgiev Bozhilov in the educational and scientific-research activities fully correspond to the minimum national and specific requirements of the Faculty of Chemistry.

After getting acquainted with the materials and scientific works presented in the competition, analysis of their significance, and the scientific and scientific-applied contributions contained in them, I find it reasonable to give my **positive** assessment and **recommend** to the Scientific Jury to prepare a report-proposal to the faculty council of the Faculty of Chemistry for election **of Chief assistant professor Dimitar Georgiev Bozhilov, Ph.D** for the academic position of **"Associate professor"** at PU "Paisii Hilendarski" in: area of higher education 4. Natural sciences, mathematics and informatics, professional field 4.2. Chemical Sciences (Organic Chemistry, Chromatographic Analysis).

25.08. 2023

Opinion prepared by:

Prof. Ginka Antova, PhD