

SCIENTIFIC OPINION

From Professor Antoaneta Borissova Trendafilova-Savkova, PhD, Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences

regarding the materials submitted for participation in a competition for the academic position of "Associate Professor" of Plovdiv University "Paisii Hilendarski" in the scientific field 4. Natural sciences, mathematics and informatics, professional specialty 4.2. Chemical sciences (Organic chemistry, Chromatographic analysis)

In the competition for "Associate Professor" for the needs of the Department of Organic Chemistry at the Faculty of Chemistry, announced in the State Gazette, no. 39 from 02.05.2023 and on the website of Plovdiv University "Paisii Hilendarski", **Dimitar Georgiev Bojilov**, Assistant Professor in the Department of Organic Chemistry, Faculty of Chemistry, Plovdiv University "Paisii" Hilendarski" (PU) has submitted her documents as an only candidate.

1. General presentation of the procedure and the applicant

I am included in the scientific jury for the selection of an "Associate Professor" in the field of higher education 4. Natural sciences, mathematics and informatics; professional specialty 4.2. Chemical sciences (Organic chemistry, Chromatographic analysis) according to order № ПД-21-1425 from 30.06. 2023 г. of the Rector of PU for the needs of the Department of Organic Chemistry. For participation in the competition documents are submitted by one candidate – Dr. **Dimitar Georgiev Bojilov**, Assistant Professor in the Department of Organic Chemistry, Faculty of Chemistry, PU. The full set of documents presented by Dr. D. Bojilov was in full agreement with requirements of the Development of Academic Staff in the Republic Bulgaria Act, the Regulations of its implementation.

Assist. Prof. Dimitar Bojilov, PhD, graduated from the "Meat and Milk Technology" bachelor's program at the University of Food Technology - Plovdiv in 2004, the "Computer Chemistry" bachelor's program at the PU "P. Hilendarski" in 2008 and master's program "Organic Chemistry" at the PU "P. Hilendarski" in 2009. In the period 2015-2017, he was a doctoral student of independent training in the Department of "Organic Chemistry" at the PU, and in 2017 he successfully defended his PhD dissertation. From 2012 to the present, he is working in the Department of Organic Chemistry at the PU, initially as a chemist (2012-2013), then as an assistant (2013-2018) and assistant professor (2018-present).

2. General characteristics of the candidate activity

To participate in this competition, Assist. Prof. Dr. D. Bojilov presented **24** scientific papers with a total impact factor of **34.316**, H-index **5** and total number of points **626**, with which the candidate meets and exceeds the minimum national requirements under the Development of Academic Staff in the Republic Bulgaria Act as follows:

Group A - 50 points (required **50**): PhD Thesis "Phytochemical studies on the essential oil and polyphenolic complex of yarrow, peppermint and Jerusalem oak" (2017) for obtaining the educational and scientific degree "Doctor" in scientific field 4.2. Chemical sciences at Faculty of Chemistry, PU.

Group V - 155 points (required **100**): 7 publications (5-Q1 and 2-Q3) in international scientific journals with high impact factor, published between 2017 and 2023. Dr. Bojilov is the first and corresponding author in two of them.

Group G - 215 points (required **200**): 17 publications in international scientific journals with IF and/or SJR (1- Q1, 2-Q2, 2-Q3 and 12-Q4).

Group D – 206 points (required **50**): The number of citations of the scientific publications of Assist. Prof. Dr. D. Bojilov, included in the competition for Associate Professor, which are available in the scientific database Web of Science/Scopus (with IF and/or SJR) is 103.

The educational and teaching activity of Assist. Prof. Dr. D. Bojilov is impressive. For the period 2018-2023, 2428 hours were produced in bachelor's programs - 481 hours of lectures, 1867 hours of exercises and 80 hours as supervisor of doctoral students, as well as 180 hours of lectures and 100 hours of exercises in master's programs. The total number of hours (2708 hours) significantly exceeds the minimum number of hours for teaching and learning activities (1080 hours) according to the additional requirements of the Faculty of Chemistry - PU for occupying the academic position "Associate Professor". Assist. Prof. Dr. D. Bojilov was the head of 1 and a participant in 8 scientific research projects financed by the BNSF or the Scientific Fond at PU.

Assistant Professor D. Bojilov has a clearly defined scientific topic, which is related to the development and optimization of chromatographic conditions in order to obtain a fingerprint of the polyphenolic complex of medicinal plants and foods with important biological significance. This also includes the identification of secondary metabolites (polyphenols and essential oil components) using mass spectral methods – GC-MS and UHPLC-MS/MS in *Habarella rhodopensis*, *Chenopodium botrys*, *Vernonia amygdalina*, *Rosa damascena*, *Lactuca* spp – *Lactuca sativa* *Batavia* cv. *Maritima*, *Lolo rosa* cv. *Tuska* and cv. *Winter Butterhead*, *Nepeta transcaucasica*, *Nepeta cataria* and *Helichrysum italicum*, and evaluation of the antioxidant activity of the essential oils of *Helichrysum italicum* and *Nepeta* species and of the *in vitro* anti-inflammatory and anti-arthritic activities of *Chenopodium botrys*.

The scientific contributions of the articles included in the habilitation work refer to establishing the polyphenolic composition of a number of medicinal plants, as well as the waste product from the distillation of rose oil; identification of compounds not reported so far as components of the studied species such as glycosides and flavones in *Chenopodium botrys*, 6 gallic acid glycosides, quercetin galloyl hexoside and kaempferol disaccharide in *Rosa damascena*, caffeoylquinic acids, apigenin and luteolin glycosides in *Vernonia amygdalina*; the study of the structure of 6-methoxy flavones and glycosides, phenylethanoids and C-glycosides in negative ionization mode. Information on the essential oil composition of two species of *Nepeta* – *Nepeta transcaucasica* and *Nepeta cataria*, as well as *Helichrysum italicum* was also obtained.

I would like to note as a significant scientific contribution, the mass-spectral study of the structure of polyphenolic compounds in *Habarella rhodopensis* extracts in negative ionization mode - the distinction between dihydrocaffeic and caffeic acids and between C-6 and C-8 glycosides, which is cited in 27 scientific publications and dissertations.

Other studies have scientific-applied contributions such as the studies on 3 types of lettuce and the dependence between different fertilizing practices and the polyphenol composition, as well as the studies on the antioxidant and anti-arthritic activity of *Chenopodium botrys* fractions. The use of organic fertilizers led to an increase in the content of polyphenolic compounds in *Lolo rosa* cv. *Tuska* and cv. *Winter Butterhead*, while in *Batavia* cv. *Maritima* the opposite effect was observed. The established relationships between the type of compounds (quercetin glycosides and 6-methoxy flavones) and the respective activity can be used in the development of new pharmaceutical products with medical and pharmacological applications.

The more significant contributions of the works of Assit. Prof. D. Bojilov, outside the habilitation work, refer to the determination of the antioxidant activity of mushroom species growing in Bulgaria and to the synthesis, mass spectral analysis and biological activity of substituted 2-phenylethylamines and their cyclic analogs, of sulfonamide derivatives and biofunctional hybrid molecules.

The presented materials show that Assit. Prof. D. Bojilov thoroughly and excellently knows the state of research in the field of chemistry of natural secondary metabolites, chromatographic methods for their separation and mass-spectral methods for their characterization. I believe that Dr. D. Bojilov with his knowledge and experience has made a significant contribution to the presented publications, and the formulated contributions and obtained results are to a large extent his personal work.

3. Critical remarks and recommendations

I have no substantive criticisms.

CONCLUSION

The documents and materials presented by Assist. Prof. Dimitar Bojilov, PhD, meets all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of ZRASRB and the relevant Regulations of the PU "Paisii Hilendarski".

The candidate in the competition has submitted a sufficient number of scientific works published after the materials used in the defense of the educational and scientific degree "doctor". The candidate's works contain original scientific and applied contributions that have received international recognition. The scientific and teaching qualifications of Assit. Prof. Dimitar Bojilov, PhD, are unquestionable.

The achievements of Assit. Prof. Dimitar Bojilov, PhD, the results in the educational and scientific-research activity, fully correspond to the minimum national and additional requirements of the Faculty of Chemistry, adopted in connection with the Regulations of the PU for the application of ZRASRB.

After getting acquainted with the materials and scientific works presented in the competition, analyzing their significance and the scientific, scientific-applied and applied contributions contained in them, I find it reasonable to give my positive assessment and to recommend the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Chemistry for the selection of Dr. Dimitar Bojilov to the academic position of "associate professor" at PU "P. Hillendarski" in: area of higher education 4. Natural sciences, mathematics and informatics, professional speciality 4.2. Chemical Sciences (Organic Chemistry, Chromatographic Analysis).

21.08.2023

Signature:

(Prof. Dr Antoaneta Trendafilova)