

REVIEW

by Prof. Lyubomir Evstatiev Makedonski, Ph.D.

Department of Chemistry, Medical University "Prof. Dr. Paraskev Stoyanov", Varna
on the materials, scientific works, teaching and research activities and documents reflecting the
professional development and improvement of

Chief Asst. Prof. **Katya Peycheva Ivanova, Ph.D.**,

single participant in a competition (announced in SG 14 / 18.02.2022), to hold the academic
position of "Associate Professor" in the field of higher education 4. Natural science, mathematics
and informatics, professional field 4.2 Chemical Sciences, specialty "Chemistry" for the needs of
the Department of Chemistry, MU "Prof. Dr. Paraskev Stoyanov" - Varna

I was elected as a member of the Scientific Jury by the Order № P-109-168/ 14.04.2022 of the
Medical University "Prof. Dr. Paraskev Stoyanov" - Varna. At the first meeting of the Scientific
Jury, held on 27.04. 2022, according to Art. 127 (para 2 and 3) of the Regulations for development
of the academic staff of the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna, I was
chosen as a reviewer.

General characteristics of the candidate's teaching, research and applied research activities

In the announced competition for holding the academic position of "Associate Professor"
participates only one applicant – Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D. who currently
works at the same department.

The applicant has presented in electronic form (USB flash memory) containing a set of
documents and publications of Chief Asst Prof. Katya Peycheva Ivanova, Ph.D for participation in
the announced by MU "Prof. Dr. Paraskev Stoyanov" - Varna in SG, no. 14/ 18.02.2022
competition for the academic position of associate professor in the field of higher education 4.
Natural sciences, mathematics and informatics, professional field 4.2 Chemical sciences.

The presented materials and documents fully meet the requirements of Law of the
Development of the Academic Staff in Republic of Bulgaria and the Regulation for the
development of the Academic Staff of Medical University - Varna.. The career development of
Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D in the last few years as a Ph.student, lecturer and
researcher at the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna is well documented.

The points declared by the applicant by groups of scientometric indicators for the academic
position "Associate Professor" are as follows:

| Indicator | Minimal requirements | Points of applicant |
|-----------|----------------------|---------------------|
| A | 50 | 50 |
| B | 100 | 100 |
| G | 200 | 205 |
| D | 50 | 66 + 42* |

* Presented citations outside the minimum scientometric indicators for the academic position "Associate Professor"

In group of **indicators A**, the applicant is presented a thesis on the topic: "Determination of toxic chemical elements in the system water-biota-sediments", MU - Varna, Varna, 2017, 165 pages, for earning a PhD degree (**50 points**).

In a group of **indicators B**, the applicant is presented a monographic work entitled "Toxic and essential elements in the Black Sea fish species. Assessment of the potential health risk for the consumer ", 2021, 133 pages, Varna, MU-Varna, ISBN 978-619-221-356-5 (**100 points**)

In a group of **indicators G**, Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D has submitted a total of 12 scientific papers. The distribution by type and quartiles (Q) of these publications is as follows: 2 publications with Q1, 4 publications with Q2, 1 publication with Q3 and 5 publications with Q4 (**205 points**). There are additional 11 scientific paper presented as full-text publications in scientific journals and collections, outside the minimum scientometric requirements for acedemical degree associate professor.

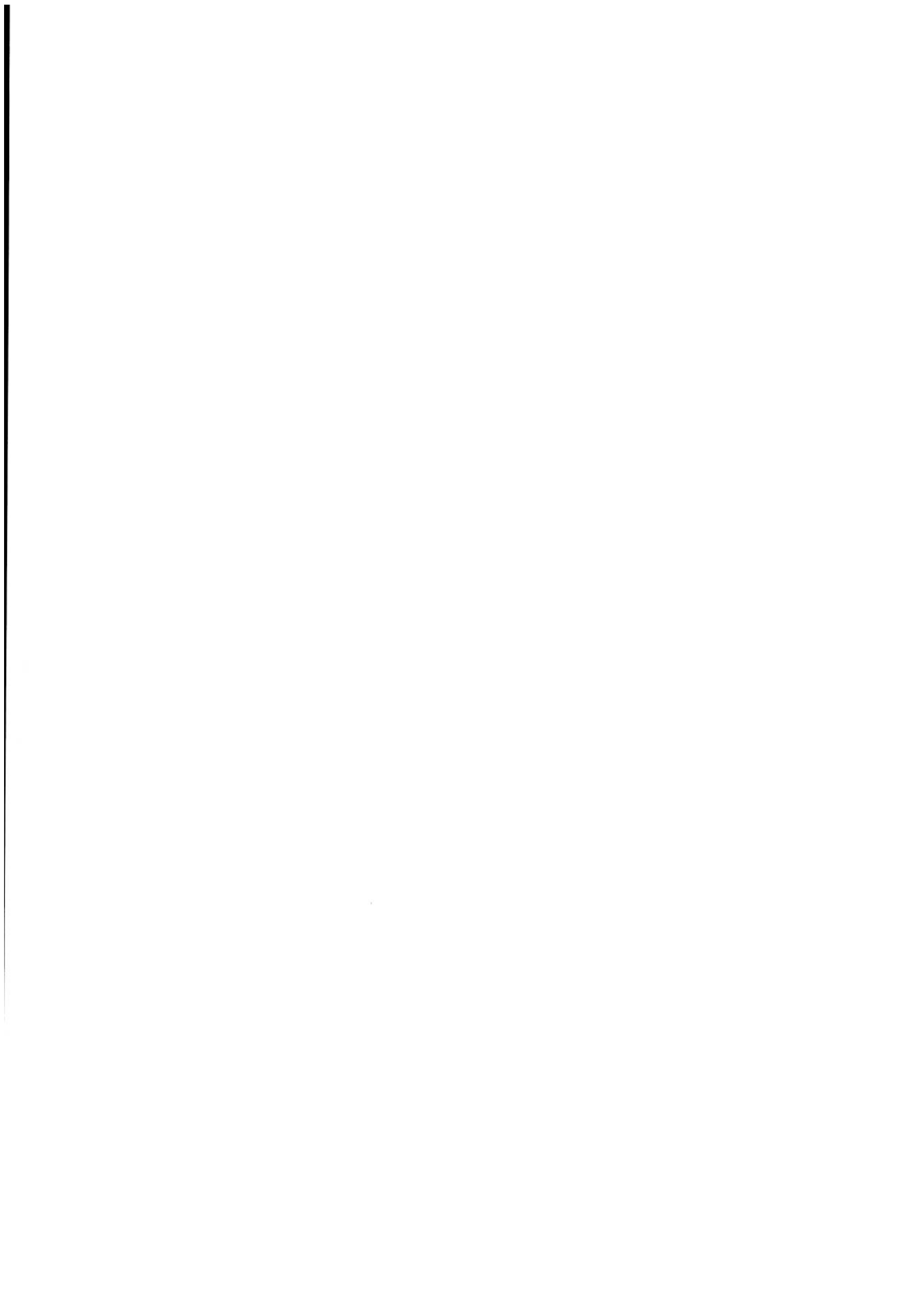
In group of **indicator D**, the applicant evidence a total of 33 citations (excluding self-citations) of papers in scientific journals, reflected in the Web of Science and Scopus databases (**66 points**). There are also 21 additional quotes outside the minimum requirements, which the candidate has presented in the competition.

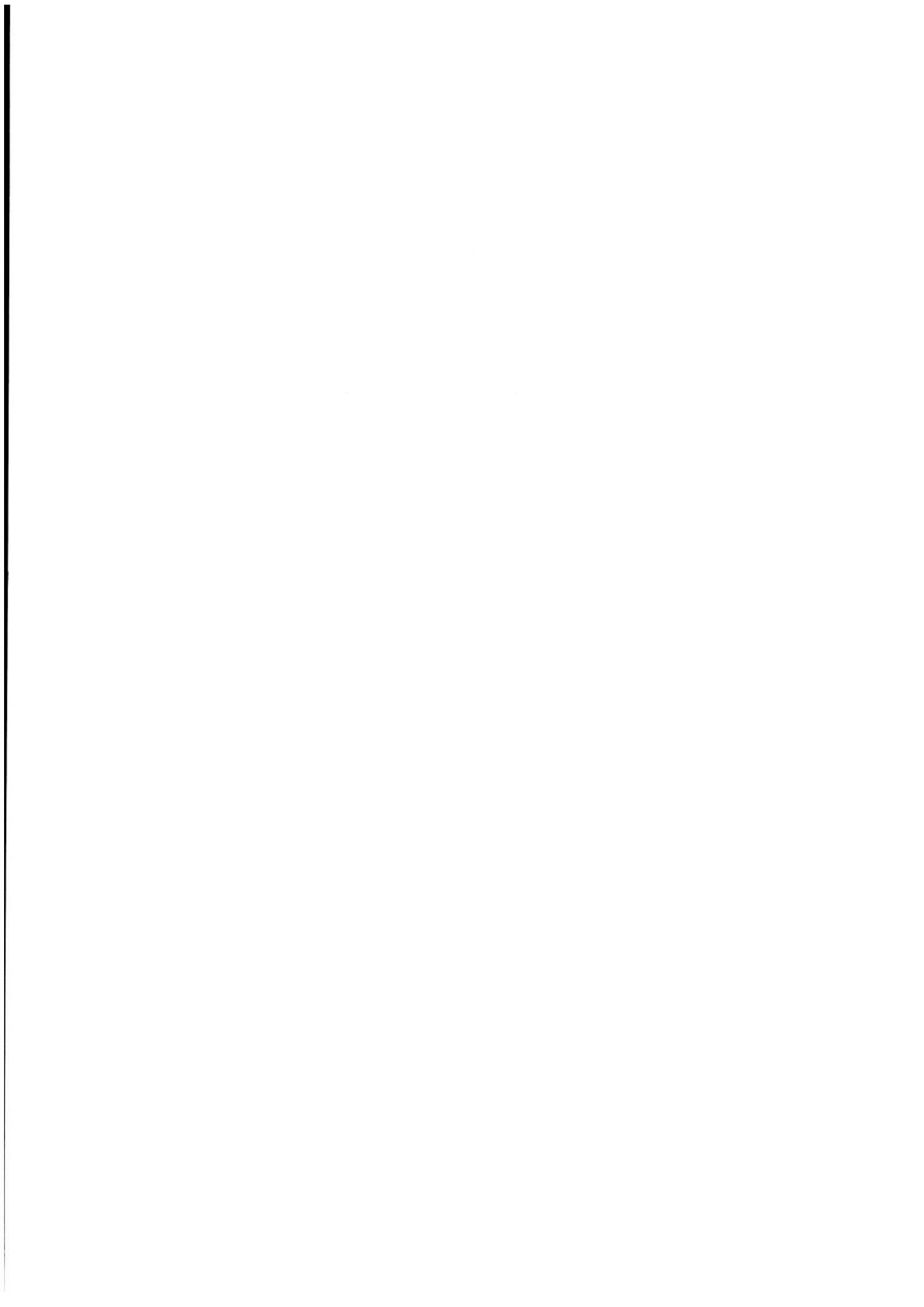
Brief biographical data and carrier development

Chief Asst. Prof Katya Peycheva Ivanova, Ph.D graduated with a bachelor's and master's degree from the Faculty of Chemistry at Sofia University "St. Kliment Ohridski ". During her studies at the master's degree program at Sofia University (Modern Spectral and Chromatographic Methods of Analysis) she had prepared her thesis at IMEC, Leuven, Belgium under the supervision of Prof. Mihail Baklanov. Since 2008 she has been appointed as an assistant at MU-Varna. In 2015 she was enrolled in the doctoral program at the Department of Chemistry at the Faculty of Chemistry. Regarding her scientific and experimental work, Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D. had visited the Lancaster Environmental Center at the University of Lancaster, UK and worked under the supervision of the Prof. Hao Zang.

She had defended her dissertation on topic "Determination of toxic elements in the system water-biota-sediment " at MU - Varna under my scientific supervision at 2017.

Since 2018 she has been a chief assistant professor at the Department of Chemistry.





Teaching activities

The teaching activity of Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D significantly exceeds the mandatory classroom employment of MU "Prof. Dr. Paraskev Stoyanov "- Varna of 360 hours/year. For the previous academic year (2020-2021), she had totally 552 academic hours of teaching.

Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D teaches classes in the following disciplines: Lecture courses in Physical Chemistry and Colloid Chemistry as well as elective discipline of Chemistry and Environment for the major of Pharmacy (Master Degree) at Bulgarian language program; Practical exercises and seminars in Chemistry for the major of Medicine, both Bulgarian and English language program and for the major of Dental Medicine, Practical exercises and seminars in General and Inorganic Chemistry and Physical Chemistry and Colloid Chemistry for the major of Pharmacy(Master Degree), Bulgarian language program.

Co-authorship of textbooks and manuals

Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D is a co-author of 10 textbooks and manuals, most of which are intended for students in English language program.

Participation in the development of academic study program

Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D has participated in the development of curricula in "Chemistry" for students majoring in Medicine and Dental Medicine (English language program); in "General and Inorganic Chemistry" for students majoring in Pharmacy (Master's degree) and elective course of "Environment and Health" for students majoring in Pharmacy (Master's degree).

Further academic studies and postgraduate courses

Chief Asst. Prof. Katya Peycheva Ivanova, Ph.D. periodically raises her qualification. During the period 2016/2019, she had completed a postgraduate specialization in the field of "Theoretical Foundations of Medical Chemistry" and attended a number of postgraduate courses.

Scientific activity

Areas of scientific interest

The scientific interests of Chief Asst. Prof. Katya Peycheva Ivanova, PhD are in the field of toxic and essential elements of Black Sea and freshwater organisms, safety of seafood and freshwater foods; food quality and potential effects on human health for a healthy style of life; optical emission spectroscopy.

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Presenting materials for the competition

The scientometric indicators of chief asst. prof. Katya P. Ivanova, PhD meet the criteria of Law of the Development of the Academic Staff in republic of Bulgaria and the Regulation for the development of the Academic Staff of Medical University - Varna. For the period 2008 - 2021 (which includes 9 active research years and 4 years of maternity leave), the applicant has a total of 33 scientific publications distributed in the following order: 1 abstract of a Ph. thesis, 1 habilitation thesis (monograph), 31 scientific publications in journals with / without SJR and / or IF and 39 participations in scientific forums.

In the current competition for the academic position of associate professor, chief asst. prof. Katya P. Ivanova, PhD participates with 23 scientific papers, of which:

- Habilitation thesis - monograph - 1
- Publications and reports, published in scientific journals with SJR and / or IF (indexed in Scopus and / or Web of Science) -12
- Publications and reports, published in scientific journal referenced in the Web of Science- 14
- Publications and reports in non-referred peer-reviewed journals or conference proceedings without IF and SJR (non-indexed) - 7 issues

Of the presented publications for participation in the competition, the applicant is a leading author of 11 of them, and 14 is the second or third, which shows independence both in setting scientific aim and in presenting scientific results and their final publication. The total IF of the journals in which the candidate has publications is **20,585**.

Applicant's citations

The number of citations of chief asst. prof. Katya P. Ivanova, PhD are 119 according to SCOPUS and 256 according to Google Scholar. The applicant has an h-index 3 (SCOPUS). The applicant holds best poster awards from her participations in international forums.

Applicant's participation in scientific forums

Chief Asst. Prof. Katya P .Ivanova, PhD has participated in 39 national and international conferences and various forums with international participation in Bulgaria. 31 of them are with poster presentation and 8- are oral reports. The dynamics of these scientific communications is very favorable (17 of them are in the last 5 years).

Applicant's participation in research projects

Chief Asst. Prof. Katya P.Ivanova, PhD has contributed to the development and implementation of 8 scientific national and international projects.

Main contributions

The main area in the research of Chief Asst. Prof. Katya P. Ivanova, Ph.D. is a characterization of Black Sea and freshwater organisms in terms of content of toxic pollutants and nutritional parameters and is undoubtedly extremely relevant in the light of the common EU policy for the introduction of strict standards for quality control and safety at sea and freshwater foods.

At the same time, fish and molluscs are an indicator organism, according to the European Water Directive and the content of toxic pollutants in them can be used to characterize the degree of pollution in the Black Sea and other sea and river basins. In this aspect, the applicant's systematic research is of significant national and regional interest and it fits within the objectives of the Maritime Strategy of the Republic of Bulgaria (2022-2027) for environmental protection of marine waters.

On the other hand, the researches on food quality and its potential effects on human health aims to ensure a healthy life and promote the well-being of the population in every age group. The scientific contributions of the applicant's papers can be grouped thematically in the following areas:

1. Safety of Black Sea marine and freshwater fish species and molluscs

1.1. Total content of toxic and essential elements in Black Sea marine fish species, molluscs and freshwater fish species.

A comparative study on the content of some toxic and essential elements in various tissues of Black Sea and freshwater organisms covering the period 2010-2021 was presented. Toxic and essential elements have been found to accumulate to the greatest extent in metabolic organs such as liver and gills of Black Sea fish species. There is a tendency to decrease the total concentration of the studied chemical elements in the Black Sea fish and molluscs with the time.

1.2. Total content of toxic and essential elements in Black Sea water and sediments

A mathematical description of the dependences of sea water and sediments and pollution of marine organisms has been developed. An assessment of the degree of distribution of toxic and essential elements in the seawater-biota-sediment system was performed.

1.3. Risk assessment related to the consumption of Black Sea fish species, molluscs and freshwater fish species

The weekly / daily intake of a number of toxic and essential elements in the Black Sea and freshwater organisms has been calculated and it has been found that they are lower than the conditionally permissible weekly intake established by various health organizations (JECFA, WHO, EC). The target hazard quotient (THQ) and the hazard index (HI) for the Black Sea fish species and freshwater organisms under study have values lower than one and show that there is no risk in their consumption. The target risk (TR) of the Black Sea marine and freshwater fish

species and molluscs is below acceptable levels and illustrates that there is no risk of further cancer risk in less than ten thousand people associated with the consumption of these organisms.

2. Composition and biological / functional activity of marine and freshwater organisms and molluscs.

The quality of seafood is determined by the amount and ratio of macronutrients (lipids, proteins and carbohydrates), their energy value, digestibility and taste. The chemical composition of different marine organisms varies due to differences in a number of factors such as habitat, biometric characteristics and many others. Lipid composition and vitamin content in Black Sea and freshwater fish and molluscs were studied; the influence of season and thermal stress on the lipid composition of marine molluscs and the content of phenolic compounds and biological activity of mollusk extracts mollusks and algae.

The presented data on the changes occurring in the lipid composition during heat treatment are used to assess the nutritional qualities of Black Sea fish and molluscs. The traditional methods of culinary processing used not only reduce pathogenic microorganisms and improve the taste of food, but also prove to be gentle on the studied biologically active components.

The presented data on antioxidant and antibacterial activity of extracts of Black Sea molluscs provide information on the presence of specific biologically active compounds that can be identified and isolated from the extracts and find applications in the development of medicinal products of marine origin.

3. Assessment of the risk-benefit ratio in the consumption of Black Sea molluscs

The benefit / risk ratio calculated as the ratio of the recommended daily allowance of essential fatty acids and the concentration of a toxic elements to the EFA content (EPA + DHA) in this marine organism shows that the benefits of consuming Black Sea molluscs in terms of EPA and DHA content significantly outweigh the risks associated with the intake of toxic and essential elements.

Scientific contributions

The results for the total concentration of toxic (As, Cd, Hg, Ni and Pb) and essential (Cr, Cu, Fe, Zn and Mn) elements show that the pollution of different marine species and freshwater fish species and molluscs is below the maximum allowable limits according to number of national and international health organizations. The quality of Black Sea fish and mussels as a food based on fatty acid profile, PUFA / SFA and omega-6 / omega 3 ratios, and lipid indices (atherogenic, thrombogenic and cholesterol) was assessed. It was found that the analyzed marine Black Sea organisms are good source of polyunsaturated fatty acids and vitamins, which defines them as a food source of very good quality. The obtained data can be used to enrich databases on the chemical composition of some of the most commonly consumed species of fish and molluscs in Bulgaria. The safety of some Black Sea and freshwater fish and molluscs (mussels and rapana wreck) was

assessed on the basis of calculated daily /weekly intakes, THQ , TR and HI. The results obtained for the content of toxic and essential elements and the parameters characterizing the quality of lipids were used to assess the risk-benefit ratio in the consumption of these marine and freshwater products. The data have a monitoring character since they cover a long period of time and can be used to compare with those from other seas. The presented results are a significant step towards the introduction of an appropriate species of fish / molluscs as indicator organisms of pollution of the Black Sea

Organizational skills and tasks associated with administrative jobs

Chief asst. prof. Katya P.Ivanova, Ph.D. was an academic coordinator of the first year students, major "Medicine" , English language program. She has an experience as a mentor to student demonstrators at the Department Chemistry.

Personal impressions

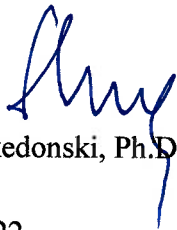
I have been known chief asst. prof. Katya P. Ivanova, Ph.D. since her first day at the MU-Varna. My personal impressions are that she is an extremely tolerant, responsive and responsible colleague, as well as an extremely conscientious and precise researcher. She has a significant contribution role in starting the English language program of Chemistry at our university. She had actively participated in the setting, organizing and editing textbooks and various paper materials at English language program.

In conclusion: The documents and materials submitted by chief asst. prof. Katya P. Ivanova, Ph.D. meet all the requirements of Law of the Development of the Academic Staff in Republic of Bulgaria and the Regulation for the development of the Academic Staff of MU - Varna.

The applicant has presented significant number of original scientific papers, which have received international recognition and has been published at peer-reviewed journals. After considering and analyzing the significance and contribution of the materials and scientific papers, I fully express my positive opinion and highly recommend to the members of the Scientific Jury to vote positively for the awarding of the academic position of "Associate Professor" to chief asst. prof. Katya Peycheva Ivanova, Ph.D., a single participant in this competition (announced in SG 14 / 18.02.2022) to hold the academic position of "Associate Professor" in the field of higher education 4. Natural science, mathematics and informatics, professional field 4.2 Chemical Sciences, specialty "Chemistry" for the needs of the Department of Chemistry, MU "Prof. Dr. Paraskev Stoyanov "- Varna

REVIEWER

Prof. Lubomir Makedonski, Ph.D.



Varna, May 10, 2022.