

EXPERT OPINION

by **Prof. Dr. Tsonko Paunov Paunov, PhD, Educational Sector Epidemiology in the Department of Hygiene and Epidemiology, Faculty of Public Health, MU "Prof. Dr. Paraskev Stoyanov" - Varna, specialist in Epidemiology, living in the city of Varna; phone: +359887056626,**

Concerning the procedure for the dissertation work defense for the acquisition of the educational science degree (ESD) "Doctor" in the field of higher education 7. Health care and sports, Professional direction 7.1. Medicine, by scientific specialty "Hygiene (including labor, communal, school, radiation, etc.)".

Author of the dissertation: **Dr. Yavor Hristov Chenkov**, full-time doctoral student at the Department of Hygiene and Epidemiology, Faculty of Public Health at the University of Varna .

Topic of the dissertation: "**Pollution of the Varna region of the Black Sea with plastic waste and possible risks to human health** "

Research supervisor: **Prof. Dr. Teodora Dimitrova, d.m**

By order No. R-109-651/ 28.12.2023 of the Rector of the Medical University - Varna, I was elected as a member of the Scientific Jury, and on the basis of Protocol No. 1/ 05.01.2024 I was appointed to prepare an opinion on the acquisition procedure of scientific and educational degree (SED) "Doctor" with candidate Dr. Yavor Hristov Chenkov, full-time doctoral student at the "Hygiene and Epidemiology" Department, Faculty of "Public Health" at the Medical University - Varna.

Biographical data

Dr. Yavor Chenkov was born in Dupnitsa in 1989. He obtained his Master's degree in Medicine from the University of Medicine - Varna in 2016.

Dr. Chenkov's professional experience began in 2016 at UMBAL "St. Marina" EAD, Varna, where he worked as a paramedic until 2017. The doctor has accumulated considerable

professional experience, particularly in the clinical aspect, as he has been a resident and specialist at UMBAL "St. Marina" EAD, Varna, from 2017 until now. Since 2016, he has also been an assistant in the "Hygiene and Epidemiology" department of the Medical University - Varna after successfully competing for the position. He participates in conducting practical classes for students from various specialties, including Medicine and Dentistry. The topic of his dissertation work, which is closely related to his scientific research and publications, is in the field of physics, microclimate, and environmental pollution. Dr. Chenkov is fluent in English and French, which he applies in his research activities. He has excellent theoretical and practical training in hygiene and participates in the university education of students. His teaching activities include teaching in English to a large extent. He demonstrates very good computer literacy. Dr. Chenkov specializes in "Clinical Hypnosis and Hypnotherapy". He participates in the projects: "The Green Sea Yard of Varna" and "Project Mars-25". He is a member of the Bulgarian Medical Association, Bulgarian Psychiatric Association, and the Bulgarian Association of Aviation, Marine, and Space Medicine.

According to the procedure

Assistant Dr. Yavor Hristov Chenkov is enrolled as a full-time doctoral student in the doctoral program "Hygiene (incl. labor, communal, school, radiation, etc.)" in the field of higher education 7. "Health and Sports", professional direction 7.1. "Medicine", with the topic of the dissertation work "Pollution of the Varna region of the Black Sea with plastic waste and possible risks to human health" and scientific supervisor - Prof. Dr. Teodora Dimitrova, MD, with Order No. R- 109-21/01.02.2019 of Deputy. the rector of the MU "Prof. Dr. Paraskev Stoyanov" - Varna Prof. Dr. Albena Kerekovska, MD He has successfully passed the doctoral minimum exam. Dismissed with the right of defense by Order No. R-109-236/ 11.04.2023 of the Rector of the Medical University - Varna.

The administrative documents according to the procedure provided for in the ZRASRB, the Regulations for its application and the Regulations for the development of the academic staff of the University of Varna are presented in full.

The dissertation, developed by Dr. Yavor Chenkov, consists of 168 pages and contains 21 figures, 2 tables and 1 diagram. An archive of rich photographic material and a survey with author's questions are presented in the appendices. The literary reference includes 337 literary sources, of which 2 in Cyrillic and 335 in Latin.

The structure is maintained, which is made up of the following elements: introduction 5 pages,

literature review 45 pages, aim and objectives 1 page, materials and methods 7 pages, results and discussion limitations 41 pages, recommendations and future directions 10 pages, conclusions 1 p., conclusion 4 p. The work is the culmination of the dynamic scientific research of Dr. Yavor Chenkov supported by several years of theoretical and practical preparation regarding a huge socially sensitive problem of our time, namely the consequences of anthropogenic pollution on the planet.

Relevance of the topic. The topic of anthropogenic pollution is of global concern. Despite its partial isolation, the Black Sea is not exempt and contributes to the planet's pollution. In recent years, we have witnessed incidents of increasing scale and severity, which adds a particular urgency to the subject. The escalating rates of plastic pollution in water bodies, coupled with the slow degradation of plastic in nature and inadequately developed waste management strategies, represent one of the most significant environmental challenges of our time. These issues raise concerns both for the sustainability of ecosystems and for human health. In the early 1970s, the scientific community began to express increasing concerns about the presence of plastic pollution in the open ocean, which directed research in this area. Research on plastic pollution in the Black Sea region is limited. The PhD student's detailed understanding of the problem is evident. The facts underscore the exceptional significance of the developed dissertation work.

The **introduction** is concise and informative, and the literature review comprises about a quarter of the dissertation's volume. It is based on 337 sources, over 80% of which are from the last 10 years. The review provides up-to-date information on the topic. The doctoral student is well-informed and adept at handling literary data.

The **goal** is clearly and precisely formulated, focusing on a better understanding of the current issue of plastic pollution in the Bulgarian waters of the Black Sea and adjacent coastal areas. The potential for creating a simplified conceptual framework for a step-by-step and segmented study of this problem in the Varna Region is indicated.

The **tasks** are ambitious, numbering five in total, and are well-formulated. They respond to the set objective and include a survey of citizens' awareness of plastic pollution in the region, categorization of anthropogenic debris, assessment of quantity, type, and indicative degree of their degradation, a survey of products with potential microplastic character, and supplementing existing recommendations and guidelines for conducting environmental monitoring regarding

anthropogenic plastic pollution in the Varna region.

The **methods** used for the conducted studies were comprehensive, addressing the multifaceted nature of the problem: The documentary method was used for the analysis of the content of the scientific works related to the topic of the current dissertation work; the survey method (sociological) was employed to conduct a survey on the knowledge of the citizens of the city of Varna regarding some aspects of plastic pollution; statistical and graphic methods, photographic methods, field work for the selection and survey of territories to collect material for analysis, and laboratory-microscopic analysis were also utilized.

The '**Results and Discussion**' section corresponds to the set tasks. The results of the survey among the citizens of Varna, as well as those of the field activity and the laboratory-microscopic analysis of the collected plastic debris, have been studied and summarized. The properties of the various collected debris, which are of great heterogeneity, are categorized and described in exceptional detail. A snapshot of the pollution is presented at a precisely defined point in time, at precisely defined locations. A comparison was made with the other two studies of the Black Sea coast. The results are illustrated with rich photographic material of the collected waste. Graphical representations of the statistically processed data are presented.

The obtained **results** have served to formulate recommendations for the intervention of the state and scientific institutions, as well as for an active position and assistance from the society to deal with the problem. A model of a conceptual framework for a phased and segmented study of the various aspects of the problem of plastic pollution in the environment in the Varna region is proposed.

First , 11 **conclusions are drawn** , which accurately summarize the results of the own studies.

I fully accept the proposed total of 9 contributions.

With an original character:

1. Fundamental steps have been taken to implement ecological monitoring regarding the detailed morphology of plastic pollution in the coastal areas of the Varna region.
2. The first detailed categorization of the quantities, sizes, and types of plastic waste in some coastal areas of the city of Varna was carried out.
3. An initial assessment was made of some of the most common types of microparticles of potential plastic nature added to commercially available personal care products.
4. For the first time, a microscopic analysis of waste from plastic pollution in the Varna region was carried out, with the aim of tentatively determining the degree of fragmentation and

degradation of plastic waste left in the environment.

5. A visual conceptual framework has been created for a step-by-step and segmented study of plastic pollution and its various aspects in the Varna region.

Of a confirmatory and applied nature:

1. A narrative review of the scientific literature addressing plastic pollution in watersheds and coastal areas, and the resulting potential risks to ecosystems and human health, was conducted.
2. The data from the present study could contribute to the conduct of future training, practical, and informational campaigns. Through these efforts, the problem of plastic pollution in the Varna region can be brought into public discourse, including through the engagement of citizen science networks.
3. Recommendations are provided for a step-by-step and segmented study of the problem of plastic pollution in the Varna region, by optimizing and implementing various aspects of environmental monitoring.
4. The data from the present study serve as a starting point for supplementing and expanding the teaching material on hygiene and ecology, as well as other areas of knowledge. I have no significant recommendations and critical remarks for the doctoral student.

Conclusion: The dissertation work is completed, and it is the original work of the author. It serves as a good example for guiding future studies towards the implementation of ecological monitoring regarding plastic pollution in the coastal areas of the Black Sea region. The uniqueness of the dissertation stems from the fact that, at present, this is the third study for the Black Sea water area and the first in Bulgaria regarding the characteristics of plastic and microplastic pollution, and the resulting potential risks for ecosystems and human health.

I highly appreciate Dr. Chenkov's participation in a scientific forum and his publications in connection with the dissertation work. He has two publications in the Supplement to the Journal of Biomedical and Clinical Research and "Social Medicine", and one publication in a collection of reports titled "Proceedings of the Ninth Student Scientific Conference on Ecology and Environment".

He has also participated in three scientific forums:

Jubilee scientific conference with international participation "New approaches in public health and health policy", MU-Pleven, FOZ. 26.11-28.11.20;

9th Student Scientific Conference "Ecology and Environment", April 23-24, 2021;

9th Sea and Health Festival, May 18-20, 2023, MU-Varna.

The dissertation meets the requirements of the Law on the Development of the Academic

Staff of the Republic of Bulgaria . The work is presented in a complete and well-formed form.

The dissertation work "Pollution of the Varna region of the Black Sea with plastic waste and possible risks to human health" has scientific and practical value. I firmly believe that the work has all the qualities of a dissertation for the scientific and educational degree "Doctor" in the field of higher education 7. "Health and sport", professional direction 7.1. "Medicine", in the scientific specialty "Hygiene (including labor, communal, school, radiation, etc.)". I give my positive vote for the awarding of the scientific and educational degree to Dr. Yavor Hristov Chenkov and allow myself to recommend to the honorable members of the committee to vote positively for the work.

10.02.2024

Prepared the opinion :

Varna

Prof. Dr. Tsonko Paunov, MD

Заличено на основание чл. 5,
§1, б. „В“ от Регламент (ЕС)
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