

STATEMENT

by Assoc. prof. Milen Peychev Todorov
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Regarding dissertation work titled: "Study of road sediment pollution along major and secondary transport arteries in Burgas"

Author **Dimitrinka Slavova Ivanova**, doctoral candidate in independent preparation at the department of Ecology and Environmental Protection, Faculty of Natural Sciences at University "Prof. Dr. Asen Zlatarov" – Burgas

Candidate's career profile

Eng. Dimitrinka Slavova Ivanova is a graduate of University "Prof. Dr. Asen Zlatarov" – Burgas. She completed her higher education "Master" in 1999. Since September 2003 she has been appointed as assistant at the Department of Ecology and Environmental Protection (EEP).

Dimitrinka Ivanova was assigned by order of the Rector of the University "Prof. Dr. Asen Zlatarov", No246/18.10.2021 as a PhD student in independent training at the Department of EEP, at the Faculty of Natural Sciences. The dissertation work is on the topic "Study of road sediment pollution along major and secondary transport arteries in Burgas", with scientific supervisors Assoc. prof Alexander Dimitrov and Assoc. prof. Yordanka Thisheva. In 2022, by order No119/26.07.2022 of the Rector of the University "Prof. Dr. Asen Zlatarov" Dimitrinka Ivanova was awarded with the right to defend the PhD thesis.

The presented set of materials and documents is in accordance with the requirements of the Law on Development of Academic Staff in the Republic of Bulgaria and the Regulations for its application, the Higher Education Act, as well as with the rules of the University "Prof. Dr. Asen Zlatarov".

The dissertation work is in a volume of 127 printed pages. The text of the dissertation includes 32 figures and 17 tables and 5 graphic images. 121 literary sources were cited. The dissertation is properly structured and contains all the necessary elements presented in logical consequence.

The literary review shows a good knowledge of the subject. Contemporary data on the topicality of the problem are provided. The importance of the influence of motor vehicles on ambient air and road surfaces is underlined.

The purpose and the tasks assigned are precisely formulated. The applied approach and the modern methods of research used allow the achievement of the goals and tasks.

The road traffic in the Burgas has been investigated in respect to spread of pollutants in the ambient air and road surface. The data was used to build a digital transport map by applying a specialized computer application. There was a sampling of a road map from 12 points of the road network. By applying laser diffraction analysis, it was found that 45.4% of the road sediment contain particles less than 30 μm in size whereas 54.5% are found to be of size 30-75 μm .

In order to evaluate the presence of heavy metal in the road sediment additional study have been performed. Samples were analysed for Cr, Ni, Co, Zn, Cu, As and Pb. Analyses show the presence of heavy metals with the concentrations of Ni, Cu, Zn and Pb being high at locations with traffic intensity above 500 vehicles/24 h. For all samples the average concentration of the studied pollutants were higher in the fractions with a particle size below 40 μm . The results of the samples in low traffic sections (including inter-block spaces) show low concentrations for Ni, Cu, Zn and Pb despite the large amount of formed road sediment.

The results and discussion are about 60% of the dissertation work. The work is well structured, logically linked to the presented results, illustrated by figures and tables. Based on the conducted research and results the conclusions follow quite and logically. They are directly related to to the goal and represent the doctoral candidate's ability to summarize, synthesize and analyze the results of scientific research.

Contributions and significance for science and practice.

The contributions correspond to the obtained results and have a scientific and applied character.

- A methodology for calculating the absolute value of traffic during the year has been developed and implemented. Load coefficients are determined on hourly, daily seasonal basis;
- A correlation has been proven between monthly concentration of nitrogen oxides and the change of intensity of movement of vehicles;
- The experimental results for road sediment and heavy metals are related to atmospheric air pollution with fine dust particles;
- The obtained data results can be applied for calculation of emission factors for fine dust particles as important factor of transport pollution in cities.

A comprehensive review of the scientific literature was carried out in full consistent with the topic of the dissertation. The literary reference contains 121 sources, of which 26 are in Cyrillic and 95 in English. The majority of references have been published in the last 10 years.

In connection with the dissertation work are presented 4 publications in scientific journals, referenced and indexed in world databases with scientific information. Dimitrinka Ivanova has presented information about participation in 3 scientific conferences with international participation.

Recommendations

I recommend that the PhD student should look for opportunities to promote the results of the dissertation study, which are up-to-date and practically applicable.

Conclusion

The scientific work developed by Eng. Dimitrinka Ivanova, contains research study of high scientific value and the discussed issues are especially actual. The structure and volume of the work meet the requirements set out in the Law on Development of Academic Staff in the Republic of Bulgaria and in the Regulations for its application for the acquisition

scientific jury to award the Eng. Dimitrinka Ivanova with educational and scientific degree
“Doctor” in direction 4.2 “Chemical sciences”.

11.10.2022.
Burgas

Подпис заличен
Чл.2 от ЗЗЛД
Signature
/Assoc. Milen Todorov/