

## STATEMENT

By DSc Dilyan Georgiev Georgiev, Associate Professor at the Faculty of Biology, Plovdiv University "Paisii Hilendarski"

On a dissertation for the award of the educational and scientific degree "Doctor"  
in: Higher Education Area 4. Natural Sciences, Mathematics, and Informatics  
Professional Field 4.3. Biological Sciences  
Doctoral Program "Ecology and Ecosystem Conservation"

**Author:** Nikola Stamenov Angelov

**Topic:** "Opportunities for Sustainable Management of Urban Soils through Buffer Grass Strips"

**Scientific Supervisors:** Prof. Dr. Iliana Georgieva Velcheva, University of Plovdiv "Paisii Hilendarski", Faculty of Biology, Department of Ecology and Environmental Conservation, and Assoc. Prof. Dr. Ekaterina Georgieva Valcheva, Agricultural University – Plovdiv, Department of Agroecology.

### 1. General Description of the Submitted Materials

By Order No. ПД-21-2267 dated December 10, 2024, of the Rector of Plovdiv University "Paisii Hilendarski" (PU), I have been appointed as a member of the scientific jury for ensuring the procedure for the defense of the dissertation titled "Opportunities for Sustainable Management of Urban Soils through Buffer Grass Strips" for the award of the educational and scientific degree "Doctor" in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.3. Biological Sciences, doctoral program "Ecology and Ecosystem Conservation." The author of the dissertation is Nikola Stamenov Angelov – a part-time doctoral student at the Department of Ecology and Environmental Protection, with scientific supervisors Prof. Dr. Iliana Velcheva, University of Plovdiv "Paisii Hilendarski", Faculty of Biology, Department of Ecology and Environmental Conservation, and Assoc. Prof. Dr. Ekaterina Valcheva, Agricultural University – Plovdiv, Department of Agroecology.

The set of materials in paper format, in accordance with Article 36 (1) of the Regulations for the Development of the Academic Staff at the University of Plovdiv, includes the following documents:

- Application to the Rector of the University of Plovdiv for the initiation of the procedure for the defense of the dissertation;
- Curriculum vitae in European format;
- Protocol from the department council regarding the report on the readiness for initiating the procedure and the preliminary discussion of the dissertation;

- Dissertation;
- Abstract;
- List of scientific publications related to the dissertation topic;
- Copies of the scientific publications;
- List of cited references;
- Declaration of originality and authenticity of the attached documents.

The doctoral candidate has included two publications related to the dissertation. All of the scientific articles have been published in the journal Land, which is ranked in Q2 and has a high impact factor.

## **2. Relevance of the Topic**

The topic of the dissertation, "Opportunities for Sustainable Management of Urban Soils through Buffer Grass Strips," is highly relevant as it addresses key ecological and urban planning challenges in the context of increasing urbanization. The deterioration of soil quality in urban environments due to compaction, pollution, and changes in the hydrological regime necessitates sustainable management approaches.

The focus on phytoremediation as an eco-friendly method for restoring soil health and buffer grass strips as a tool for ecological protection is particularly significant. Incorporating these aspects reflects current international priorities for reducing pollution and preserving soil resources, as outlined in EU strategies and global environmental policies. The relevance of the study makes the scientific work not only timely but also with high applied potential.

## **3. Knowledge on the Topic**

The doctoral candidate demonstrates a deep understanding of the topic, which is evident from the structure and content of the dissertation. The literature review covers key aspects related to soil-ecological conditions in urban environments, phytoremediation of contaminated soils, and buffer grass strips, showcasing a good grasp of the theoretical foundations and current research trends.

The formulated objectives and tasks are clearly defined and aligned with the current challenges in the field, indicating a solid understanding of the complexity of the issue. The choice of methodology, including the selection of experimental sites, plant species, and soil parameter analyses, demonstrates a systematic and scientifically grounded approach to the research.

## **4. Research Methodology**

The research methodology is developed in detail and aligns with the objectives and tasks of the dissertation. The approach is structured and scientifically grounded, covering all stages of the experimental work.

The selection of experimental sites within the regulatory boundaries of Plovdiv was made considering the diversity of soil conditions, ensuring the representativeness of the results. The choice of plant species for establishing buffer grass strips was based on both the phytoremediation potential of the species and the conditions of the urban environment.

The application of physico-chemical soil analyses, including the assessment of chemical elements content and soil community characteristics, was conducted using standard methodologies that ensure reliability and reproducibility of the results. The inclusion of mathematical-statistical processing further enhances the objectivity of the conclusions.

## **5. Characteristics and Evaluation of the Dissertation and its Contributions**

Nikola Angelov's dissertation provides original scientific data on the elemental composition of urban soils and the biomass from buffer green strips established around transport arteries in the city of Plovdiv. For the first time in the city, buffer areas have been created with selected plant species with high bioaccumulation capacity. The dissertation includes a validated technology for establishing buffer green areas with bioremediation functions and an approved model for the sustainable management of urban soils, which will be provided to relevant institutions for future regulatory decisions.

## **6. Evaluation of the Publications Related to the Dissertation**

The doctoral candidate has included two publications related to his dissertation. He is the fourth author in both of them. All the scientific articles have been published in the journal Land, which is ranked in Q2 and has a high impact factor. The collected points meet the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Application of ZRASRB, and the corresponding Regulations of the University of Plovdiv "Paisii Hilendarski."

## **7. Abstract**

The abstract meets the requirements for its preparation and contains a brief summary of the dissertation with its main scientific contributions, as well as the titles of the publications related to it.

## **8. Recommendations for Future Use of the Dissertation's Contributions and Results**

It could be recommended to expand the scope of the study to other urban areas with different soil conditions to confirm the results on bioremediation and the effectiveness of buffer grass strips. The results can be integrated into urban planning and used to develop policies for the sustainable management of soils and green spaces. They could also serve as a basis for creating regulatory documents containing specific guidelines for bioremediation.

## **CONCLUSION**

The dissertation contains scientific, applied scientific, and practical results that represent an original contribution to science and meet all the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Application of ZRASRB, and the corresponding Regulations of the University of Plovdiv "Paisii Hilendarski."

The dissertation demonstrates that the doctoral candidate, Nikola Stamenov Angelov, possesses theoretical knowledge and professional skills in the scientific specialty "Ecology and Ecosystem Conservation," showing qualities and abilities for independently conducting scientific research.

Therefore, based on the above, I confidently give my positive evaluation of the research presented in the reviewed dissertation, abstract, achieved results, and contributions, and I propose to the esteemed scientific jury to award the educational and scientific degree of "Doctor" to Nikola Stamenov Angelov in the field of higher education: 4. Natural Sciences, Mathematics and Informatics, professional field 4.3. Biological Sciences, doctoral program "Ecology and Ecosystem Conservation."

03.01.2025 г.

**Signature:** .....

Assoc. Prof. Dilian Georgiev