



## REVIEW

on a dissertation for obtaining the scientific degree "Doctor" in the area of higher education  
4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences, scientific specialty Ecology and ecosystem protection

**Author:** Ivelina Dimitrova Neykova

doctoral student at the Department of Microbiology and Ecological Biotechnology at the Agricultural University, Plovdiv.

**PhD thesis title:** Phytoremediation of heavy metals in contaminated soil through composts and beneficial microorganisms in vegetable crops

**Reviewer:** Gana Minkova Gecheva, PhD, Assoc. Prof., Plovdiv University „P. Hilendarski, area of higher education 4. Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences, scientific specialty Ecology and ecosystem protection, appointed a member of the scientific jury by order № ПД-16--611/31.05.2022 from the Rector of AU.

### 1. Relevance of the problem.

The negative effects of heavy metals on plant organisms have been documented for a long time, but the question of how we can effectively reduce or eliminate it is still open. The applied biotechnological approach in phytoremediation techniques ensures the topicality of the dissertation topic. It is important to note the definite applied aspect of the study.

### 2. Purpose, tasks, hypotheses and research methods.

The aim of the dissertation is clearly and precisely formulated, the set tasks are a guarantee for its achievement. Within the experiments, three test plants (spinach, radish peas), contaminated soil from the area of KCM - Plovdiv and compost from the company "Biovet" Peshtera AD, as well as various bacterial isolates were used. The approaches, methods and indicators used are described in detail in the section.

### 3. Visualization and presentation of the obtained results. Discussion of the results and used literature.

The "Results and Discussion" section contains a detailed presentation of the results obtained, which are clearly illustrated with tables and figures. Based on the conducted research with microorganisms, PhD student Neykova confirms the effectiveness of phytoremediation with compost. More than 500 contemporary literary sources have been used.

### 4. Contributions to the dissertation.

The contributions of the dissertation are grouped as scientific, scientific-applied and applied. Two contributions are formulated to the first and last category, and four to the second. I accept them completely.

#### **5. Critical remarks and questions.**

In the section "Literary Review" the frequent use of foreigners as persistent, transnational, sequestration, probably as an influence from the original text, is impressive. In the same section, the figures are not of good quality.

#### **6. Published articles and citations.**

The publications of PhD student Neykova on the topic of the dissertation are a total of 4, of which two (one in Bulgarian) in proceedings of national conferences, one chapter of a book and one article in a journal referenced in Scopus. He is the first author in two of them. The publications amount to nearly 35 points with a minimum of 30 points, required according to the Regulations for application of the LDASRP. No quotes are provided.

The presented abstract objectively reflects the structure and content of the dissertation.

#### **CONCLUSION:**

The presented dissertation meets the requirements of the LDASRP and the Regulations of the Agricultural University for its application, which gives me reason to evaluate it POSITIVE.

I allow myself to propose to the esteemed Scientific Jury also to vote positively and to award Ivelina Dimitrova Neykova the scientific degree "Doctor" in the scientific specialty "Ecology and Ecosystem Protection".

27.06. 2022 г.

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