



OPINION

on a dissertation for obtaining the educational and scientific degree "Doctor" in the field of higher education 6. Agricultural sciences and veterinary medicine, professional field 6.5. Forestry, scientific specialty "Forest plantations, selection and seed production"

Author of the dissertation: Eng. Nikolay Yanchev Stoyanov, PhD student of independent training

Topic of the dissertation: "Distribution, variability and health status of the species from *Ulmus* genus in Northern Bulgaria"

Member of the scientific jury: Assoc. Prof. Dr. Georgi Hinkov Ivanov

1. Brief introduction of the PhD student

Engineer Nikolay Stoyanov was born in 1974 in the town of Svishtov. He graduated from the University of Forestry in 1997 with honors. In 2008 he completed a master's program in "Plant Protection" at the Agricultural University of Plovdiv. He has worked in both - the state forestry administration and private business. He has the greatest experience and experience in the Forest Seed Control Station Sofia, where he was an expert for about 9 years. In 2017-2019 he was director of the Forest Protection Station in Sofia. He was a participant or leader in several projects, incl. a scientific-applied project to the forestry department.

2. General characteristics of the dissertation - volume and structure

The dissertation contains 232 pages, of which 110 are in Appendix. The structure of the dissertation meets the requirements. Contains all the sections that are needed. The main text contains 15 tables and 38 figures. Most of the figures are actually photographs and illustrate the scientific results well. The Appendix includes an additional 9 tables, 9 thematic maps with the distribution of elms in Northern Bulgaria, 28 descriptions of sample plots, 43 passports of "plus" trees and others.

3. Relevance of the problem

The topic of the dissertation is relevant. In the last 20-30 years in Bulgaria there are no new studies on the species of the genus *Ulmus*. During this time, Nikolay Stoyanov has several publications where he is a leading author. The topicality is mainly due to the fact that the elms continue to dry, especially the field and mountain elms. The damage are large and are caused by the so-called Dutch disease. This requires the identification of genetic resources and the making of recommendations for their use, conservation and restoration. The PhD student Nikolay Stoyanov has coped with these tasks for Northern Bulgaria.

4. Literary awareness

A total of 155 literature sources are cited in the dissertation. Of these, 66 are in Cyrillic (three are in Russian) and the remaining 89 are in other languages. These are titles mainly in English, but there are in German, French, Spanish and others. Articles from different countries and at different times are cited. There are publications that are from the beginning of the massive elm

disease, from the 40s of the twentieth century. The literature review is in-depth and covers all included research topics.

5. Purpose, tasks and methods of research

The main goal of the study is: distribution, variability and health status of the genetic fund of the species of the genus Elm in Northern Bulgaria and the possibilities for its conservation by *in situ* and *ex situ* methods.

The following scientific tasks are set:

- analysis of the condition of the elm genetic fund and mapping of the established localities;
- study of the biological diversity in the natural habitats of the available ecotypes and forms;
- selection of seed production plantations and plus trees, their inclusion in the National Register of the forest seed production base;
- preservation of the valuable genetic fund by representatives of the genus *Ulmus* by the methods *in situ* and *ex situ*.

6. Significance of the obtained results, interpretations, visualization and conclusions

The obtained scientific and scientific-applied results are significant and up-to-date. The conclusions and recommendations made are well interpreted and properly reflect the research conducted. The presented material is understandable and is in accessible scientific language. It is illustrated with tables, figures and photos.

7. Contributions to the dissertation

The most important scientific and applied contributions are:

1. A comprehensive large-scale study on the distribution of *Ulmus* species in Northern Bulgaria has been carried out. An information database has been created - maps for the location of the *Ulmus laevis*, *U. minor*, *U. glabra* and partially of the *U. pumila* in the studied area;
2. The categorization of the variability of some morphological features of the three elms in the studied territory has been proved and made;
3. A comprehensive assessment of the health status of the established elm trees in Northern Bulgaria has been made;
4. A laboratory protocol for *in vitro* propagation of *Ulmus laevis* has been developed and its introduction in *in situ* and *ex situ* propagation programs has been proposed;
5. A total of 170 plus trees of the genus *Ulmus* have been selected for Northern Bulgaria - 79 of field elm, 51 of mountain elm and 40 of white elm;
6. 12 forest subdepartment are proposed for inclusion in the seed production base of the Republic of Bulgaria, as plantations for seed production;
7. Recommendations have been made to improve the technology for the production of seedlings and two experimental crops have been created. Saplings for construction of a branch archive of different types of elm have been produced and presented to the National Forest Board.

8. Critical remarks and questions

My critical remarks are mostly of a technical nature - minor spelling mistakes and technical omissions have been made. The dissertation would have looked better if the forestry maps had been replaced by more informative ones than the Executive Forest Agency maps. The climatic characteristics are quite detailed and can be shortened. To reduce the volume of the dissertation,

a summary of some of the documents in the Appendix could be made. The notes made do not belittle the contributions and qualities of the presented dissertation.

9. Evaluation of the quality of scientific publications

Seven publications by the PhD student Nikolay Stoyanov are indicated. All are on the topic of doctoral work. In two international papers published in collections and in the magazine "New Knowledge" Nikolay Stoyanov is an single author. He is a leading author in a publication in the refereed journal "Forest Sciences". In three peer-reviewed journals, one of which is in Romania, Eng. Stoyanov is the second or third author. Some of the articles are cited in Bulgarian and international publications.

10. Personal contribution of the PhD student

The dissertation is a personal work of the PhD student Nikolay Stoyanov. In the seven articles he has included, in four of them he is a single or lead author. These publications reflect the main results, contributions and recommendations of the dissertation.

CONCLUSION:

Based on the mastered and applied by the PhD student different research methods, correctly performed experiments, summaries and conclusions, I am of the opinion that the presented dissertation meets the requirements and the Regulations on the terms and conditions for obtaining scientific degrees and taking academic positions at BAS, which gives me reason to evaluate it POSITIVE.

I allow myself to propose to the esteemed Scientific Jury to vote positively and to award to Eng. Nikolay Yanchev Stoyanov the educational and scientific degree "Doctor" in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, professional field 6.5. Forestry, scientific specialty "Forest plantations, selection and seed production".

DATE:
September 10, 2021

Member of Scientific jury: .
(Assoc. Prof. Dr. Georgi Hinkov Ivanov)