

STATEMENT OF OPINION

By D.Sc. Evgeniya Neshova Ivanova

Professor in Genetics at the University of Plovdiv "Paisii Hilendarski"

concerning a dissertation for awarding the educational and scientific degree "doctor" by:
field of higher education 4. Natural sciences, mathematics and informatics; professional direction
4.3. Biological Sciences; PhD program Genetics

Author: Sibel Dzhevdet Aziz

Topic: **Study of genetic variability in representatives of vegetable crops through
molecular markers**

Scientific supervisors:

Prof. Dr. Teodora Atanasova Staykova

Prof. Dr. Nasya Borisova Tomlekova

I have been appointed by an order No. RD-21-457/02.03.2023 of the Rector of the University of Plovdiv "Paisiy Hilendarski", as a member of the scientific jury to ensure a procedure for the defense of Sibel Dzhevdet Aziz's dissertation work on the topic "Research of genetic variability in representatives of vegetable crops through molecular markers" for the acquisition of the educational and scientific degree "doctor" in the field of higher education 4. Natural sciences, mathematics and informatics; professional direction 4.3. Biological sciences; doctoral program Genetics.

1. General presentation of the procedure and the doctoral student

Sibel Aziz is a graduate of the University of Plovdiv with a Bachelor's degree in Bioinformatics and a Master's degree in Biotechnological Microbiology and Biology Teacher. Since 2019, she has been a full-time doctoral student at the Faculty of Biology of the University of Plovdiv, Department of Developmental Biology, majoring in Genetics.

As can be seen from the CV and the presented documentation, her scientific interests are in the field of general, population, agricultural and molecular genetics. Her research and academic experience has been continuously enriched during her years of study. In the period 2019 – 2022, Sibel Aziz conducted research specializations at Hacettepe University and Atomic Energy Center, Ankara, Turkey. She participated in a number of international and national projects, which contributed to her growth as a researcher and professional.

The doctoral student's professional experience is based not only on her work in significant scientific projects, but also on her responsibilities as an assistant at the Maritsa Research Institute, where she applies her accumulated knowledge of molecular biology with applications in agriculture, genetics, bioinformatics, and proteomic research. Her scientific research in the institute's molecular biology laboratory is focused on genotypic characterization of breeding materials and the study of genetic diversity in vegetable crops.

During her studies at Plovdiv University, as well as at present, Sibel Aziz has demonstrated significant leadership and organizational qualities. She is characterized by initiative, good communication skills, abilities to work in a team, possesses excellent computer training and skills in applying various software programs.

I have the pleasure of knowing Sibel Aziz since her student years. Throughout her studies, she has always been responsible and committed to the learning process. An outstanding organizer, an important part of all significant student initiatives. Radiant, respectful of her colleagues and teachers, always ready to respond when solving assigned tasks. Curious, energetic and active! She is a wonderful example of a hard-working, responsible and dedicated young researcher.

The presented documentation is in accordance with the Regulations for the Development of the Academic Staff of the University of Plovdiv. The dissertation contains 200 standard pages, 51 figures and 26 tables. It is properly structured and contains an introduction, literature review, aim and objectives, results and discussion, conclusions, contributions, cited literature, information about the doctoral student's publications on the topic of the dissertation.

2. Relevance of the topic

The study is aimed at the characterization and analysis of genetic variability in vegetable crops and is based on a complex of molecular methods. It is aimed at creating molecular marker systems for genotyping the vegetable crops tomatoes, potatoes and beans, and on this basis the genetic variability in selected representatives of them was analyzed.

The dissertation development is serious and large-scale, with distinct fundamental and applied significance. Its fundamental nature, as well as its significant practical applicability, is based on the in-depth study of representatives of three economically valuable plant species in their different species, varieties and hybrid variations and on the well-chosen molecular genetic approaches and markers for analysis. Such a complex of molecular markers for the characterization of the studied objects in Bulgaria has not been applied till the moment, nor has this kind of research been conducted, which is the basis of the serious contributions of an original nature of the elaboration. This fact undoubtedly determines its relevance and importance.

3. Knowing the problem

The literature survey made is rich and includes 323 literary sources, three of which are in Cyrillic. The PhD student has thoroughly researched and analyzed in groups a huge amount of scientific literature in order to have the opportunity to compare the data of her work with various results and analyzes of other researchers and authors. From the presented literary information, it is clear that the doctoral student is familiar with the research problem in detail. This is evident from the structural organization of the work and from the analyzes and discussion.

In the literature review, she has presented sufficient data on the importance of vegetable crops, the importance of mutagenesis, the meaning and application of molecular markers in plant biotechnology. Separately and thoroughly, she has focused on the peculiarities of the studied plant objects, emphasizing studies of their genetic variability through the application of molecular genetic tools. As a result of the literature review, the deficits of a certain type of research in Bulgaria, dedicated to the studied problem, have been outlined.

The set goal and accompanying tasks are clear and indicative of the focus of the research. They precisely indicate the structural stages of the implementation of the planned study.

4. Research methodology

In the "Material and methods" part, the plant material - the object of the study - is described in detail.

The methods used are described in detail. Work protocols, recipes, bioinformatics databases, statistical approaches are presented.

In general, the methodology used is suitable for achieving the set goal. It is based on a complex of selection and molecular genetic approaches. All applied techniques are precisely described and some of them are well illustrated with figures. Appropriate statistical analyzes were used. All this is a basis for the quality output of the well-planned dissertation work.

5. Characterization and evaluation of the dissertation work and contributions

The obtained results, their discussion and their complex analysis are a motivated basis for the conclusions drawn and the formulation of 10 conclusions, presented briefly and clearly.

The results of the study are illustrated with a lot of high-quality photographic material and systematized in data tables - by groups for the individual studied objects and the applied molecular genetic analysis.

The doctoral student has correctly indicated and well systematized the contributions of her dissertation into groups. Based on the data obtained, their analysis and the conclusions drawn, she has formulated four groups of contributions which were as follows - five original, four scientific-applied, three confirmatory and four - methodological in nature.

Systematized contributions correspond to the results obtained and the conclusions done. They confirm the originality, scientific applicability and methodological significance of the research.

6. Evaluation of the publications and personal contribution of the doctoral student

The publication activity of the doctoral student is in accordance with the minimum national requirements for acquiring the PhD degree in professional direction 4.3. Biological Sciences. On the topic of her dissertation, the doctoral student has presented two scientific publications in journals with Q3 and Q4, of which she is the first author and a book chapter of which she is a co-author. The submitted declaration of originality confirms the fact that the dissertation work is the personal work of the doctoral student. I have not found any elements of plagiarism in the dissertation work.

7. Abstract

The presented draft of the abstract is properly prepared and reflects the essence of the dissertation work. In its final version, the composition of the scientific jury should be added and the reviewers should be noted.

8. Recommendations for future use of dissertation contributions and results

Sibel Aziz's dissertation research is characterized by originality and complexity. It could be used as a model, both for future additional investigations of the studied objects by the usage of new molecular markers, and for studies of other economically important plant species. I recommend that the results of the study be popularized in as many scientific forums as possible, where data on the synchronization of the selection process, induced mutagenesis and the preservation of the valuable characteristics of the studied varieties, which are among the most significant for Bulgarian.

CONCLUSION

The dissertation work of Sibel Dzhevdet Aziz on the topic "Study of genetic variability in representatives of vegetable crops through molecular markers" contains scientific and scientific-applied results that represent an original contribution to science and meet the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation and the relevant Regulations of PU "Paisiy Hilendarski".

The dissertation shows that the doctoral student Sibel Aziz has in-depth theoretical knowledge and significant professional experience in the scientific specialty "Genetics". In the course of her studies at PhD degree, she has demonstrated her skills in applying various methodological approaches to achieve clearly formulated scientific goals, organizing experimental activity, processing, analyzing and summarizing scientific results. This characterizes Sibel Aziz as an established young researcher with great potential for future scientific activity in the field of biology, genetics and selection.

Due to the above, I confidently give my positive assessment for the presented dissertation work, abstract, achieved results and contributions, and I propose to the honorable scientific jury to award the educational and scientific degree "doctor" to Sibel Dzhevdet Aziz in the field of higher education: 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences, Doctoral Program "Genetics".

04/03/2023
Plovdiv

Prepared the opinion:
Prof. D.Sc. Evgeniya N. Ivanova