OPINION

on a dissertation work for acquiring the educational and scientific degree *Doctor* in the field of higher education: **6. Agrarian Sciences and Veterinary Medicine**, professional area: **6.3. Animal Breeding**, scientific specialty: ***Farm Animal Breeding, Biology and Bio-engineering of Reproduction***

Author of the dissertation work: Yanka Deneva Ivanova-Mihaylova
a part-time doctoral student in the Department of Animal Breeding Sciences at the Agricultural University – Plovdiv

Title of the dissertation work: ***Molecule Markers for Genotyping and Evaluation of the Genetic Resources of Local Sheep Breeds in Bulgaria***

Reviewer: prof. Dimitar Ferdinandov Grekov, DSc – Agricultural University of Plovdiv in the field of higher education: 6. Agrarian Sciences and Veterinary Medicine, professional area: 6.3. Animal Breeding, scientific specialty: 04.02.01 ***Farm Animal Breeding, Biology and Bio-engineering of Reproduction,***
assigned a member of the scientific panel with Order № РД-16-779/05.07.2022 by the Rector of AU Plovdiv.

1. Topicality of the problem.

The present dissertation work under review has relevant scientific and practical significance for the sheep breeding in Bulgaria. Systematic molecular studies have been carried out, which included a large number of Bulgarian breeds. This gives grounds to further more thorough research study on the local breeds on a genotype level. Using the modern research methods for examination of the populations of local sheep breeds helps to have a clearer view for the genetic diversity, as well as for their genetic features.

From this point of view, the developed dissertation work is not only topical, but also perspective for the future of the research studies, as well as for solving practical issues related to sheep breeding.

2. Aim, tasks, hypotheses and research methods.

The main aim laid by the author is to evaluate the population structure and to characterize the genetic diversity of local sheep breeds in Bulgaria using micro-satellite markers. The aim completely corresponds to the thesis of the dissertation work, as well as to the literature review and the developed hypotheses. 10 particular and exact tasks have been laid for achieving this aim. The tasks have been formulated consequently, methodically and correctly. The well-selected methodology and specifically described tasks have given the doctoral student the opportunity to receive sufficient information for analysis and interpretation. In this relation, the author has used modern research methods for examining the populations of the local sheep breeds.

3. Visualization and presentation of the received results.

The dissertation work has been structured and submitted in conformity with the requirements. Over one third of the work – 79 pages represent the chapter *Results and Discussion*. This gives clear evidence on the personal views and the individual work of the doctoral student. The above mentioned results have been illustrated with properly selected 29 figures and 22 tables.

There has been used clear, accurate, scientific and logic language style.

4. Discussion on the results and the used references.

The received results have been analyzed adequately and thoroughly within the context of the laid aim and tasks. It is evident that the doctoral student is aware of the necessary information and can skillfully use the literature references. There have been used 296 references – 22 in Cyrillic, and 274 in Latin. This gives grounds to the doctoral student to make clear and accurate conclusions and recommendations from her own work.

4. Contributions of the dissertation work.

Scientific contributions

For the first time it has been performed a comprehensive and systematic research study on the genetic resources of 12 populations of local sheep breeds in Bulgaria, 7 of which – new, based on a micro-satellite analysis in 13 locuses.

For the first time it has been conducted a correlation analysis between the genetic and phenotype matrices for analyzing 12 sheep breeds via the Mantel test.

Scientific-applied contributions

The received results can be used as a ground for systematic monitoring of the condition and development of the genetic resources of local sheep breeds and their effective management through their application in the development of programs on reproduction and conservation.

The established average correlation between the 40 genetic and phenotype parameters can serve as a starting point for the application of complex evaluation of sheep genetic resources including data from micro-satellite analyses and a set of phenotype features.

6. Critical notes and questions.

On my behalf there are no questions and critical notes to the doctoral student.

7. Published research papers and references.

PUBLISHED RESEARCH PAPERS RELATED TO THE DISSERTATION WORK:

,Mihailova Y. (2021). Genetic diversity and structure of 2 indigenous sheep breeds (Kotel and Teteven) in Bulgaria using microsatellite markers. Biotechnology & Biotechnological Equipment. 35(1): 576-585. IF=1.633. Q3 Scopus https://doi.org/10.1080/13102818.2021.1903339,

References:

1. Odjakova, T., Todorov, P., Radoslavov, G., & Hristov, P. (2022). Microsatellite Genotyping of Two Bulgarian Sheep Breeds. Diversity, 14(3), 210.1, MDPI SJR 2021 = 0.654 https://www.scopus.com/sourceid/21100924379. 2. Loukovitis, D., Szabó, M., Chatziplis, D., Monori, I., & Kusza, S. (2022). Genetic diversity and substructuring of the Hungarian merino sheep breed using microsatellite markers. Animal Biotechnology, 1-9, SJR 2021 = 0.301 https://www.scopus.com/sourceid/14943

The submitted Author`s Summary reflects objectively the structure and contents of the dissertation work.

CONCLUSION:

Taking into account the variety of research methods adopted and applied by the doctoral student, the accurately conducted experiments, as well as the received conclusions, I consider that the present dissertation work corresponds to the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and the Regulations for its application of the Agricultural University. It gives me grounds to evaluate the dissertation work **POSITIVELY**.

I allow myself to propose to the honorable Scientific Panel to vote *Positively* and to award **Yanka Deneva Ivanova-Mihaylova** the educational and scientific degree ***Doctor*** in the scientific specialty ***Farm Animal Breeding, Biology and Bio-engineering of the Reproduction***.

Date: 02.09.2022
Plovdiv

REVIEWER: .....
(prof. Dimitar Ferdinandov Grekov, DSc)