OPINION

Concerning: Dissertation for the award of educational and scientific degree "PhD" in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional field 6.3 Animal Husbandry, Scientific specialty:

" Breeding of agricultural animals, biology and biotechnics of reproduction" " at the AGRICULTURAL UNIVERSITY PLOVDIV.

Author of the dissertation: YANKA DENEVA IVANOVA-MIHAILOVA

Topic of the dissertation: " Molecular markers for genotyping and evaluation of genetic resources from local sheep breeds in Bulgaria"

Member of the Scientific Jury: Assoc. Prof. Tsonka Atanasova Odjakova, PhD, Scientific Center for Animal Husbandry and Agriculture - Smolyan, Professional field 6.3 Animal Husbandry. Scientific specialty: "Sheep and Goat Breeding".

I. Relevance of the researched problem

The dissertation presented by the PhD student examined a scientific problem related to the application of different types of genetic markers to assess the biodiversity of genetic resources in sheep breeding and their application. The use of DNA markers in sheep breeding to characterize their genetic diversity is a priority for the preservation of indigenous breeds through strict scientifically conditioned selection control.

Determining the distances and similarity between the breeds in the created clusters, based on the allele frequencies in the 13 microsatellite loci studied and, on the phenotype, can serve to develop effective evaluation and monitoring programs of the studied breeds. Studies of genetic parameters at the DNA level, such as the level of inbreeding, purity of breeds, paternity testing, are important to preserve the gene pool and breed identity. Of interest to science is the discovery of breed-unique alleles, which are of higher frequency, and would be of great benefit to the genetic differentiation of breeds and is an important prerequisite for preserving their unique qualities.

Research on genetic polymorphism, heterozygosity, inbreeding at the level of the entire autochthonous population, individual breeds, and the herds of the studied breeds confirm the relevance of the problem developed in the dissertation.

II. Purpose, tasks and research methods

The title fully corresponded to the content of the dissertation. The purpose of the study is to evaluate the population structure and characterize the genetic diversity of 12 local Bulgarian breeds of sheep using microsatellite markers. Achieving the goal was realized by completing 10 assignments. The tasks formulated in this way were sufficient for the realization of the goal, they introduced in an appropriate way in the research and represented scientific and applied interest in the researched issues. The presented review proved the wide awareness of the PhD student on the problem, the ability to handle scientific sources and drew the necessary conclusions, directing the literature reference to the subject of the dissertation. In the material and methods section, the principles underlying the dissertation work are specified. High-tech and modern methods are used.

III. Visualization and interpretation of the obtained results. References

The dissertation was written on 187 pages, and in structural terms the requirements for the content of the necessary sections were met - literature review (19 pages), purpose and tasks (1 page), materials and methods (11 pages), results and discussion (79 pages), incl. conclusion and contributions, list of references (21 pages). The presented material was very well illustrated by including in the text 22 tables and 29 figures. The analyze the trends and the current state of the populations of local sheep breeds, the dynamics of the controlled populations for the 13-year period - 2009-2021 was studied. The object of the study are 12 local breeds.

IV. Discussion of results and references.

The dissertation was developed using literary sources from publications of 22 Bulgarian and 274 foreign authors. A challenge for the author is to make the right choice among a huge amount of sources and literature to argue his thesis.

A large-scale study of 12 sheep breeds at the phenotypic and genotypic level was carried out with analysis of 13 autosomal microsatellite markers and phenotypic characterization. The results obtained from the extremely thorough and competent analysis confirm the formulated research goal and tasks. The obtained results can be used for monitoring the state and development of the genetic resources of the local sheep breeds and their effective management through their application in the development and applying of breeding, including and conservation programs.

V. Contributions of the dissertation

I accept the proposals for contributions submitted by the PhD student, as in my opinion, they are original with very high scientific value, and the presented results can serve researchers and specialists in the field of sheep breeding.

VI. Critical remarks, questions and recommendations to the candidate

On the basis of the presented dissertation, I express my high opinion regarding the excellent scientific preparation of the PhD student and the overall complex development of the dissertation work.

VII. Published articles and citations

The main part of the dissertation was presented in 1 scientific article published in "Biotechnology & Biotechnological Equipment" IF=1.633, Q3 Scopus and 2 citations are given.

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

CONCLUSION

The presented dissertation is extremely relevant and significant for science and practice, it is presented at a high scientific level. In the process of developing the dissertation, the PhD student has mastered and applied modern analytical techniques and new research methods, which has improved her qualifications and built skills for making research. She has achieved the ability to accurately analyze the data obtained and present the results clearly and motivated, as well as to formulate specific conclusions.

The dissertation fully meets the requirements of LDASRB and the Regulations on the terms and conditions for obtaining scientific degrees and for holding academic positions in the AGRICULTURAL UNIVERSITY PLOVDIV, which gives me reason to evaluate it **POSITIVE**.

I allow myself to propose to the Scientific Jury to award YANKA DENEVA IVANOVA-MIHAILOVA the educational and scientific degree "PhD" in Scientific specialty: 6. Agricultural Sciences and Veterinary Medicine, Professional field 6.3 Animal Husbandry, Scientific specialty: "Breeding of agricultural animals, biology and biotechnics of reproduction"

Date: 30.08.2022   Prepared by:...

/ Assoc. Prof. Tsonka Odzhakova, PhD /