



REVIEW

On the dissertation work for conferral of the educational and scientific degree of Doctor in the higher educational area 6. *Agrarian sciences and veterinary medicine*; professional field: 6.3. *Animal breeding*; scientific specialty: *Livestock breeding, biology and biotechnics of reproduction*.

Author of the dissertation work: Stanimir Georgiev Bonev, doctoral candidate (part-time form) at the Department of Animal Breeding Sciences, University of Agriculture, Plovdiv.

Topic of the dissertation work: *Morphometric and reproductive characterization of fish from the Acipenseridae family under the conditions of superintensive rearing technology.*

Reviewer: Assoc. Prof. Stefka Nikolova Stoyanova, PhD, Faculty of Agriculture, Trakia University, Stara Zagora; higher educational area: 6. *Agrarian sciences and veterinary medicine*; professional field: 6.3. *Animal breeding*; scientific specialty: *Fish breeding, fish farming and industrial fishing*.

Elected a member of the Scientific Jury by Order №-16-778/05.07.2022 issued by the Rector of the University of Agriculture, Plovdiv.

1. Brief presentation of the candidate.

The doctoral candidate **Stanimir Georgiev Bonev** joined the PhD programme at the Department of Animal Breeding Sciences, University of Agriculture, Plovdiv in the scientific specialty: *Livestock breeding, biology and biotechnics of reproduction*; professional field 6.3. *Animal breeding*. The training was realized in part-time format during the period of 2017-2022.

2. Topicality of the problem

The topic of the dissertation work is pertinent and of practical importance, because scientific research on sturgeon fish in Bulgaria is rather little, whereas studies related to the morphometric and reproductive characteristic of this species under the conditions of superintensive technologies have not been conducted.

The present work is the first of its kind that examines morphometric and reproductive characterization of species and hybrids of the *Acipenseridae* family under the conditions of industrial superintensive containment technology.

The thesis of Stanimir Georgiev Bonev represents major research which gives its valuable contribution to this current area related to sturgeon fish. As an economically important species, this fish is distinguished from others due to its highly valued caviar and meat quality. In this respect, it is a delicacy preferred for consumption, which increases its demand. However, the condition of natural populations of sturgeon fish has worsened and their catch is forbidden. This reasons the search for opportunities to develop and improve current technologies for the controlled rearing of sturgeon fish.

3. Research objective, tasks, hypotheses and methods.

The objective has been formulated precisely and clearly and reflects the topic of the thesis. The author has diligently formulated the realization of the three main tasks, related to conducting morphometric and reproductive characterization, studying sexual development through ultrasound monitoring of female and male sturgeon fish and the characterization of the sperm production of sturgeon under the conditions of industrial superintensive containment technology. The precise implementation of the applied methods in the study determines the depth of the conducted scientific work. This presupposes objective results of the state of the studied scientific problem and delineation of trends for future development.

4. Visualization and presentation of the obtained results.

The submitted dissertation work spans on 208 pages, it is structured in a standard form, typical for similar writings. The body of the text contains a very

good visualization of the conducted research in 36 tables and 38 figures. The list of cited works includes 223 titles – 211 authors (39 in Cyrillic), strategic documents and electronic information sources. The structure, volume, the correct use of the research methods and the illustrated presentation of the obtained results are an important condition for making an objective analysis, formulating the conclusion, inferences, and recommendations correctly and listing precise scientific contributions applicable in practice by the author of the thesis.

5. Discussion of the results and the used literature.

The obtained results correspond to the set tasks, outlined in detail in the Results and Discussion section, which is the lengthiest part of the thesis, illustrated with a sufficient number of tables and figures. A competent scientific interpretation of the obtained results relevant to the set scientific tasks has been made. They have been realized and implemented by the doctoral candidate. The wide literature review shows his excellent knowledge on the studied problem, his thorough awareness and big potential for the application and use of important technological tasks in the cultivation of sturgeon under the conditions of superintensive rearing technology. The applied methods correspond to the conducted studies and the used modern tools for achieving the established tasks. The obtained results have been processed with correct statistical analyses.

The inferences made fully correspond to the obtained results and are directly linked to the running of morphometric and reproductive characterization, study on the sexual development through ultrasound monitoring of female and male sturgeon fish and characterization of the sperm production of sturgeon fish species.

6. Contributions of the dissertation work.

1. For the first time in Bulgaria a complex study has been done on the morphometric and reproductive characterization of sturgeon fish (Russian sturgeon and F1 hybrid of Siberian and Russian sturgeon) of various age and sex, cultivated under the conditions of superintensive containment rearing technology. **Original for Bulgaria applied scientific contribution.**

2. Morphometric differences have been proven in a number of plastic and meristic indicators between Russian sturgeon and a hybrid (F1 Ab x Ag), and between the sexes within the genotype, reared in superintensive containment technology. It was established that morphometric analysis may be used as a tool for species and sexual identification, evaluation of the reaction of the fish to the cultivating conditions, as well as for determining the possibility and the directions for breeding and selection activity. **Original applied scientific contribution.**
3. The parameters of major indicators that characterize the economic qualities of the Russian sturgeon and the hybrid (F1 Ab x Ag) – fattening, compactness, thickness and width of the body, etc. - were established under the conditions of superintensive containment rearing technology, and the impact of genotype and sex on them was also determined. **Original scientific contribution.**
4. It was proven that the ultrasound diagnostics of ovaries and testes may be used for tracing the development and the stage of maturity of the gonads in live sturgeon fish, as well as for the early determination of the sex, which is of particular importance for increasing the effectiveness of caviar farms. **Partially original affirmative applied scientific contribution.**
5. For the first time the age and seasonal dynamics of gonad development have been studied and established in Russian sturgeon and hybrid (F1 Ab x Ag), cultivated under the conditions of superintensive containment technology. A comparative analysis of the sexual development of male and female individuals of Russian sturgeon and the hybrid has been made. **Original scientific contribution.**
6. It was established that under the conditions of superintensive containment rearing technology the female hybrids (F1 Ab x Ag) mature more quickly than the female Russian sturgeon, i.e. at the same age their ovaries develop significantly faster than the others. **Original scientific contribution.**
7. It was established that under the conditions of superintensive containment technology the sex of the Siberian sturgeon may be determined as early as

3 years of age. **Partially original affirmative applied scientific contribution.**

8. For the first time the seasonal dynamics of ovarian and testicular development in Siberian sturgeon cultivated under the conditions of superintensive containment technology was established. **Original scientific contribution.**

9. For the first time a study on the complex indicators of sperm production in various age groups of Russian sturgeon and hybrid (F1 Ab x Ag) was done. It was found that when cultivated under the conditions of superintensive containment technology the Russian sturgeon and hybrid exhibit good sperm production and may successfully be used for reproduction. For insemination it is recommended to use males that have reached 9 years of age. **Original applied scientific contribution.**

7. Critical comments and questions.

I have no critical comments regarding the thesis. There are several technical imprecisions at certain places which do not compromise the value of the conducted research and the merits of the presented work.

The thesis abstract reflects faithfully and precisely the sections of the dissertation work.

8. Published articles and citations.

On the topic of the thesis, the doctoral candidate has submitted 5 publications in prestigious scientific proceedings and journals, four of which are referenced and indexed in world renowned databases with scientific information. To three of the publications Stanimir Bonev is a leading author, while to the rest he is the second, which indicates his personal involvement and contribution to the scientific works.

CONCLUSION

On the basis of the scientific and applied by the doctoral candidate various research methods, the correctly conducted experiments, the generalizations and inferences made, I think that the presented dissertation work meets the

requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Statute of the University of Agriculture for its implementation, which allows me to give it my **POSITIVE** evaluation.

I allow myself to propose the honorable Scientific Jury to vote in favor of conferring to **Stanimir Georgiev Bonev** the educational and scientific degree of Doctor in the scientific specialty *Livestock breeding, biology and biotechnics of reproduction*; professional field 6.3. *Animal breeding*.

Date: 10.08. 2022g

Stara Zagora

Reviewer:.....

/Assoc. Prof. Stefka Stoyanova/