

STATEMENT

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About Dissertation for the awarding of an educational and scientific degree 'PhD' in
professional direction 4.3 Biological Sciences, Specialty 'Hydrobiology'

PhD Candidate: Borislava Kostadinova Margaritova
Sofia University 'St. Kliment Ohridski', Faculty of Biology, Department of General and
Applied Hydrobiology

Title: Study of the spawning and feeding habitats of the sturgeons in the Bulgarian section of
the Danube River

PhD Supervisors: Assoc. Prof., Dr. Eliza Uzunova and Assoc. Prof. Dr. Lyubomir Kenderov

The subject of this dissertation is very interesting and topical. As we know, the Danube River is nearly the last remaining river in the Black Sea Basin, in which the sturgeons migrate and reproduce. Six out of all eight sturgeons in Europe are found in the Danube River. Despite the increased activities for the sturgeon conservation that have been launched and implemented in recent years, the state of their populations remains critical, and two of those species – the ship sturgeon *Acipenser nudiventris* and common sturgeon *Acipenser sturio* – are already considered extinct in the Danube River Basin. The latest assessment of the International Union for Conservation of Nature (IUCN), published in July 2022, shows that the deterioration of sturgeon populations continues worldwide, which makes them the most endangered animal group globally. The conservation status of sterlet *Acipenser ruthenus* has been changed from 'vulnerable' to 'endangered'. This alarming trend has also been confirmed by the reporting of EU Member States under the Habitats Directive, where all sturgeon species are evaluated as having an unfavourable conservation status. At the national level, in spite of the adopted 10-year ban on fishing the sturgeons, the state of their populations has not been improved. All the foregoing show an exceptional need of current in-depth scientific information to serve as a basis of implementing proper and successful measures for conservation of the sturgeons in the Danube River. In addition, the sturgeons are an unique group in respect of their anatomy, life history and ecological requirements.

In the introductory part of her dissertation, the PhD candidate Borislava Margaritova conducts detailed review of the literature, which shows an extensive expertise in and understanding of the relevant subject matter. She is familiar with the basic national, European and global literature on sturgeons. She carries out a comprehensive review of the taxonomy, length and weight structure of the populations, reproduction, growth, and migration as well as feeding and trophic basis in the Danube River. She also presents detailed information about the requirements of sturgeons regarding habitats. The PhD candidate reviews the methods of studying sturgeons, with a particular attention to the minimally invasive ones. Besides, she is perfectly familiar with the policies and measures being applied for conservation of sturgeons and restoration of their populations. The presented list of 279 references cited includes the basic research publications on the subject in recent years.

On the grounds of the conducted review the PhD candidate formulates the main aim of her dissertation – to determine the potential spawning and feeding habitats of sturgeons in the Bulgarian section of the Danube River with a view to their future protection and restoration.

The study has been carried out in the period 2013–2019 in the entire Bulgarian section of the Danube River, with conducting investigation of migrations and feeding mainly in the area of the village of Vetren. The study target groups are, along with all the sturgeon fish, the accompanying ichthyofauna and macrozoobenthos. For studying the spawning habitats and migrations alone, totally 1663 samples have been collected, which is a considerable size. Taking into consideration that sturgeons get in the catches very rarely and the need of maximally non-invasive methods, appropriate methods for collecting and processing the samples have been selected, which applies also to the analysis of the data. All the available methods, incl. fishermen reports, have been used. The PhD candidate has been trained and applied some modern methods, such as the tagging of the sturgeons.

According to the results, a total of 952 sturgeons (88 adults and 864 young-of-the-year) have been caught of four species: the sterlet, starry sturgeon *Acipenser stellatus*, beluga *Huso huso*, and Russian sturgeon *Acipenser gueldenstaedtii*. The sterlet is presented in the catches with the largest number of individuals, followed by the starry sturgeon and single specimens of the other two species. Original data are provided about the length structure and length-weight relationship, migrations and spawning habitats, as well as regarding the diet composition and nursery grounds of sturgeons.

The discussion is profound, being based on the results and supported by examples from the literature, which once again shows the PhD candidate's understanding the relevant problems and subject matter, as well as her capability of analysing a large volume of scientific information. The last section and the eight conclusions made summarise the obtained and discussed results and fully correspond to the latter.

The results obtained about the studied critically endangered species have great importance from a scientific point of view since these results concern the biological and ecological parameters of sturgeons, about which there are few data available from the previous research, namely growth rate and condition, spawning, feeding, migrations, and

habitats. Proofs of the fact are the scientific publications related to the dissertation presented by the PhD candidate: two in the national issues and another two – in peer-reviewed scientific journals – Journal of Natural History and Biodiversity. This fact is also highlighted in the contributions. I only have a remark about the wording of Contribution 5. The text ‘... *The impact of hydrological regime changes resulting from anthropogenic activities on the migratory behaviour of young sturgeons was determined, and a tenfold increase in the speed of movement of young sturgeons was reported*’ should be reworded, since ‘the impact of hydrological regime changes resulting from anthropogenic activities’ was not the subject of this research, and the PhD candidate can only make an assumption that this has been the reason for the changes in the migration behaviour.

The results in the dissertation are extremely valuable because of their practical significance as well. In this connection I am glad to congratulate the PhD candidate and her supervisors on the well-timed initiatives undertaken by them in order to inform and give recommendations to the competent authorities (the Ministry of Environment and Waters, Ministry of Agriculture, Foods and Forestry, the Executive Agency of Fishery and Aquacultures, Executive Environment Agency, etc.), namely: a proposal for protecting the nursery and feeding sites of the sturgeons; recommendations for extending the period of the ban on fishing the sturgeons with another 5 years; recommendations for increasing awareness among the fishermen and implementing more effective control measures for poaching; recommendations for updating the national methodology for monitoring the sturgeons, etc. An direct consequence of those initiatives was the order of the Minister of Environment and Waters from 29 June 2022 for designation a protected area (PA) ‘Esetrite (Sturgeons) – Vetren’.

Conclusion

The dissertation presented by the PhD candidate fully conforms to the requirements of the Law on Promoting the Academics in the Republic of Bulgaria and the Rules for its implementation. All the foregoing gives me grounds to recommend with full confidence to the Esteemed Members of the Scientific Committee that the educational and scientific degree ‘PhD’ in professional direction 4.3 Biological Sciences, specialty ‘Hydrobiology’ be awarded to Borislava Kostadinova Margaritova.

Sofia 16.12.2022 г.

Assoc. Prof., Dr. Теодора Тричкова