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STATEMENT

by Prof., Dr. Snejana Petrova Moncheva - retired
member of the Scientific Jury, Order No. 211/5.08. 2026, issued by the Director of IO-BAS-Varna, regarding the procedure for defense of a dissertation for the acquisition of the educational and scientific degree "Doctor"

PhD student: Eng. Yordan Raev Raev, part-time PhD student in the "Marine Biology and Ecology" department at the Institute of Oceanology – BAS
Topic: "Technological solutions for reducing discards in fisheries",
Higher Education Field: 4. "Natural Sciences, Mathematics and Informatics", Professional Field: 4.3. "Biological Sciences", Doctoral Program: "Ecology and Ecosystem Conservation", Scientific Field: "Sustainable Exploitation and Conservation of Living Marine Resources"

The problem of increasing the selectivity of fishing gear is of fundamental importance to the concept of fisheries management based on sustainable strategies and an ecosystem-based approach. This dissertation, which investigates technological solutions for reducing discards in conventional bottom and near-bottom trawls—specifically within the context of the Bulgarian Black Sea sector and the existing international and European legislative framework—demonstrates its high relevance.

The dissertation comprises 111 pages of main text, 23 pages of appendices (6 in total), 30 figures, and 25 tables. It includes a bibliography of 218 entries—consisting of 2 titles in Cyrillic, 201 in English, and 15 online sources—and conforms to standard requirements regarding volume, structure, and formatting. The objective is clearly stated, the research tasks are presented in a logical sequence aligned with the working hypothesis, and the conclusions drawn are specific and precise; collectively, these define the dissertation as a complete scientific study.

A key element of the study is the application of a modern concept of selectivity, defined as a function of a vector of variables—including the device's design and technological characteristics, operational conditions, the capture mechanism, and the biological traits of the target species. The original, comprehensive assessment model developed (based on an in-depth analysis of 18 literature sources) required both expertise and precision to implement an adequate software script—a contribution indisputably credit of the consultant, Assoc. Prof. Zlateva, without diminishing the role and personal contribution of PhD student Eng. Raev to the overall design of the methodological framework and the execution of the studies— clearly evident by the

competence and professionalism demonstrated in the analysis, the interpretation of the obtained results, and the formulated conclusions and recommendations.

The selection of species with distinct biological and ecological characteristics (red mullet – *Mullus barbatus* – and whiting – *Merlangius merlangus*), the scope of the planned fishing operations (a total of 203 experimental trawls) and the variations in gear design (3), as well as the dataset upon which the research is based (comprising 36,241 measured individuals—23,328 specimens of *M. barbatus* and 12,913 specimens of *M. merlangus*), provide a representative sample for conducting valid analyses and verifying the results; furthermore, they attest to the doctoral student's profound theoretical and methodological competence. The primary data and operational scripts provided in the appendices ensure the reproducibility of the results—an important element in modern scientific research.

Significant results with both scientific and applied scientific contributions have been achieved. I consider the use of **new experimental data and original models** for assessing the operational selectivity of conventional trawl gear—tailored to the **specific characteristics of two commercially important species** *(M. barbatus* and *M. merlangus*) in the Bulgarian Black Sea waters—to be a **significant scientific contribution**. The applicability of Generalized Additive Models (GAM/GAMM) for the quantitative assessment of operational selectivity and for modeling the interactions between design, biological, and operational factors has been demonstrated. I consider **the confirmed high predictive capability of the developed models**—along with their proven applicability for the quantitative assessment of operational selectivity—**to be a primary and particularly significant scientific-applied contribution, possessing a multiplier effect** for practical fisheries. For both species studied, the estimated L_{50} values remain below the lengths at sexual maturity (Lm_{50}) established in the literature; this indicates that a substantial proportion of the retained specimens had not yet reached sexual maturity at the time of capture (58–61% for *M. barbatus* and 60–62% for *M. merlangus*), regardless of the specific modifications applied to the codend. I consider the following to be of **particular scientific and practical value**: the scientifically grounded technical measures for improving the selectivity of trawl gear; the prognostic scenarios formulated by interpreting the results within the context of published literature; and the theoretical relationships between mesh size, the selectivity threshold (L_{50}), and the probability of retaining individuals below the biological threshold (Lm_{50}). Based on these

elements, **effective recommendations for the sustainable management of Black Sea fish resources have been derived**—specifically, the integrated application of both technical and regulatory measures.

The abstract provides an adequate synthesis of the dissertation and has been prepared in accordance with the requirements.

The report officially generated via the StrikePlagiarism platform conclusively **demonstrates the absence of plagiarism.**

Four publications and one participation in an international forum have been presented in relation to the dissertation. All are in English; three are in journals indexed in international databases (with quartiles Q3–1 and Q4–2), and one is a paper for an upcoming international conference, for which an acceptance document has been provided. The conference paper (authored solely by the PhD student) and one of the publications (in which he is a co-lead author) cover a substantial part of the dissertation. With certain reservations, I accept the other two publications, based on the premise that they resulted from a project in which Eng. Raev participated during the time-line of the thesis preparation along with the fact that they present new knowledge regarding the biological response of fish to environmental stressors—an important aspect of the biological component of a comprehensive selectivity strategy.

Critical Remarks and Recommendations

My critical remarks concern certain shortcomings and serve, in essence, as recommendations for future research activities:

o In Section 5.7 (Discussion), the research findings should be discussed in the context of specific results obtained by other authors, with references to the relevant literature;

o Of the 7 citations listed, 6 appear in works by co-authors; by definition, these constitute self-citations and are therefore not counted;

o Some references are incomplete; for online sources, the date and year the webpage was accessed should be indicated.

My commend Eng. Raev, working for many years in leadership positions at the Fisheries and Aquaculture Executive Agency, for the initiative and carrying out this pioneering study and

furthermore recommend that the specific technological and legislative measures formulated herein to be formalized into an official proposal to the Agency and the Ministry of Agriculture.

Conclusion

The presented dissertation possesses the qualities of a completed scientific work, developed at a contemporary level, with original methodological contributions and potential for application in future research; it holds significant practical importance and offers scientifically grounded solutions for the sustainable management of fish resources as a valuable work of Eng. Raev.

On this basis, I consider that the dissertation meets the requirements for the acquisition of the educational and scientific degree "Doctor," in accordance with the Regulations for the Application of the Law on the Development of the Academic Staff in the Republic of Bulgaria and that of the Institute of Oceanology – BAS (PURPONSZAD), **declare my positive assessment** and recommend that the esteemed **Scientific Jury confer upon Eng. Yordan Raev the educational and scientific degree "Doctor"** in the professional field 4.3 "Biological Sciences".

17.10.2026 Signature:

Varna /prof. S.Moncheva/