



Вх. № 402-НО-05/24.04.2024

## STATEMENT

**By:** Assoc. Prof. Yovana Todorova Todorova, PhD, Department of General and Applied Hydrobiology, Faculty of Biology at Sofia University "St. Kliment Ohridski", member of scientific jury according to the order of the director of IBER-BAS №18/26.01.2024

**Subject:** Dissertation submitted for awarding the scientific and educational degree "Doctor"

**Author of dissertation work:** PENCHO IVANOV

**Topic of the dissertation:** STRUCTURE AND FUNCTIONS OF HYDROZOOCENOSES IN TEMPORARY DRY WATER BODIES

### 1. GENERAL CHARACTERISTICS OF PhD THESIS:

The PhD thesis of Pencho Ivanov presents the results of the first large-scale and in-depth study of drying water bodies in Bulgaria - the focus is on hydrobiocenoses, but valuable information is also given on the dynamics and role of environmental factors, key processes, and trophic relationships in these specific water bodies. The composition, structure, and formation of the zooplankton and macrozoobenthic communities as a function of the alternation and duration of dry and wet periods, as well as successive processes and limiting factors, were studied. In the end, as a result of the PhD student's long-term work, the obvious detailed knowledge, and personal attitude to the subject, finished work with the necessary focus, depth, modern scientific sound and valuable contributions regarding the hydrobiological features of drying water bodies has been obtained.

The text itself is written in a clear scholarly style; the description of the field and experimental work, as well as the presentation of the obtained results, is logical, clear, and consistent, and the discussion of the data is comprehensive, reasoned, and creatively presented in the context of the known scientific information. In terms of volume and structure, the thesis is developed on 181 pages, follows the generally accepted criteria, and includes eight chapters from a content point of view, as well as a bibliography of 111 titles and appendices with primary data and photographs.

### 2. ACTUALITY OF THE DISSERTATION:

The increasing severity of global environmental problems combined with climate changes and the intensity of extreme meteorological and hydrological events (heat waves, droughts, and floods) have undoubtedly accompanied the development of human society in recent years. Unfortunately, some of the most threatened aquatic ecosystems are inland, for which both pessimistic and realistic scenarios predict at least moderate levels of water stress in several areas. In this regard, I believe that a more in-depth knowledge of the features, dynamics, and key processes in drying water bodies (aquatic ecosystems with a dry phase) is not only a current scientific topic but also extremely necessary for the protection of biodiversity, the functioning of water ecosystems, as well as to maintain the ecosystem services they provide to society. From these positions, I find that the methodology, the work setting, and the chosen complex approach are modern, scientifically sound and reflect the good research practices of the unit where the dissertation work was developed.

### 3. SIGNIFICANCE AND CONVINCINGNESS OF THE RESULTS, CONCLUSIONS AND SCIENTIFIC CONTRIBUTIONS:

PhD student Ivanov has carried out impressive field and laboratory work, logically connected in the continuum: selection of suitable objects and points; sampling with properly selected standard methods; analysis of physical and chemical factors; hydrobiological analysis - basic parameters of zooplankton and macrozoobenthos communities; statistical data processing. As a result of this combinative approach, serious in volume and valuable in content results have been accumulated, which sound convincing and suggest a deep knowledge of the studied problem. The standing and river water bodies with the relevant environmental parameters, composition, and structure of the communities were examined sequentially. I particularly appreciate the sections related to the assessment of trophic relationships, as well as the valuable summaries after each chapter, which facilitate the understanding of the text and represent an additional level of interpretation of the scientific information. At the end of the work, seven conclusions that follow the logical sequence of the main tasks in the work were done. They correspond both to the scope of the research conducted and to their significance in fundamental and applied aspects. The PhD thesis also has undoubted contributions, which Pencho Ivanov correctly and balanced formulated, along with important recommendations and conservation measures for the protection and preservation of drying water bodies. As a comment, I would point out that for a clearer and more logical presentation of the most significant achievements, the conclusions and contributions could be grouped into different subdivisions.

### 4. ASSESSMENT OF THE QUALITY OF THE PRESENTED SCIENTIFIC PAPERS:

The scientific achievements of PhD student on the topic of the dissertation are summarized in three publications - two were presented at a scientific forum and published in full in the *Proceedings of Seminar of Ecology*, and the third was published in the international journal *Comptes Rendus de L'Academie Bulgare des Sciences*, falling into quartile 3. In two of the publications, Ivanov is the lead author, which is another indication of personal involvement and his role not only in field and laboratory analyses but also in the processing and interpretation of results and the drawing of conclusions important for practice and recommendations.

### 5. CONCLUSION:

Based on the above arguments, I emphasize once again that: (1) the work is dedicated to an extremely actual topic, it is well structured in terms of content, with successfully formulated and successfully implemented goals and tasks; (2) it contains scientific and applied contributions, which in volume and significance exceed those sufficient for a doctoral dissertation; (3) the PhD student has proven himself to be a competent scientific specialist who has long possessed the skills to independently carry out field and scientific-experimental research, I believe that the work presented by him fully meets the criteria for a doctoral dissertation according to the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Rules for its implementation. This circumstance gives me enough reasons to evaluate him POSITIVELY and I allow myself to propose to the respected Scientific Jury to award PENCHO IVANOV the educational and scientific degree "Doctor" in the scientific specialty of Hydrobiology.

08.04.2024 г.

Member of scientific jury:

/Assoc. Prof. Yovana Todorova/