

## **PERSONAL OPINION**

by Assoc. Prof. Ralitsa Petrova Zidarova, PhD

Member of the Scientific Jury for the award of a PhD degree, Order №268/10.12.2020

on the PhD thesis of **Elitsa Valentinova Hineva**, entitled: **Ecological factors limiting the distribution of the seagrasses of the genus *Zostera* in the sublittoral zone of the Burgas Bay (the Black Sea): importance of wind waves and epiphyte abundance**, area of Higher education cipher 4: „Natural sciences, mathematics and informatics“, Research area cipher 4.3: „Biological sciences“, Scientific discipline cipher 02.22.01: „Ecology and protection of the ecosystems“, research topic „Macrophytobenthos“

Scientific supervisor: **Prof. Snezhanka Moncheva, PhD, IO-BAS**

### **General characteristics of the thesis**

The PhD thesis meets the requirements of the Republic of Bulgaria and the Institute of Oceanology – BAS. Its volume is 247 standard pages (with 33 pages of Appendices). The thesis includes the following chapters: Introduction (3 pages), Literature review (16 pages), Aims and tasks (2 pages), Material and methods section (32 pages), Results and discussion with subchapters (132 pages), Summary of the results and conclusions (3 pages), List of cited literature (14 pages). A total of 220 sources are cited, 184 of which are in Latin, incl. 5 electronic ones. A list of abbreviations and contents of the thesis are provided. A reference to the primary contributions (2 pages) and a list of publications on the topic of the thesis (1 page) are given. The literature review shows the excellent knowledge of the doctoral student on the topic of the thesis. The objectives of the PhD thesis are clearly defined, and three hypotheses have been developed. The set tasks are adequate for achieving the goals. The methodology is carefully selected. The thesis is very well illustrated.

### **Relevance of the topic of the PhD thesis**

Seagrass communities are indicators of the environmental conditions in the area they inhabit. Knowledge of the influence of factors, such as local wind wave action and epiphytic load is important for the proper assessment in the event of possible changes.

### **Significance of the results and main contribution of the study**

The results of the study are thoroughly analyzed in local, but also in global aspects. The contributions of the thesis study are both scientific (1-3) and applied scientific (4-6), and are formulated as follows:

1. The limitation of the upper boundary of marine angiosperms meadows by wind waves in the regions: the Nessebar Bay, the Sozopol Bay, the Foros Bay and the lack of limiting (destructive) effect in the Chengene Skele (estuary of the Marinka River) has been proven. For each studied area the limiting directions of the approach of the wind waves are established.
2. Statistical models of the relationship between the upper boundary of seagrasses and waves have been obtained; they can be applied to unexplored areas with the same or similar wave exposure.
3. For the first time, the species *P. bicaudata* parasitizing on *Z. noltei* was found off the Bulgarian Black Sea coast, which poses the need of further studies of the mechanisms of the parasite's effect on its host.
4. It has been found that the function for exponential raise to a maximum is the most suitable to account for shading caused by the accumulated epiphytes. The coefficients of the equation for the conditions of the Burgas Bay are determined.
5. Threshold values for the maximum allowable epiphytic load are derived, depending on the light (PPFD) reaching the epiphytic layer.
6. The applied approaches and the obtained results allow for more targeted planning and resource allocation on the study of the presence of communities of marine angiosperms in different regions of the Bulgarian Black Sea coast with contribution to the optimization of the monitoring programs.

### **Summary of the thesis**

The summary of the thesis is provided in both Bulgarian (37 pages) and English (34 pages) and meets the requirements of the Institute of Oceanology – BAS.

### **Publications on the PhD thesis topic**

A total of 6 publications are related to the PhD thesis studies, two of them are published/in press in quartile journals (Q2 и Q4). The PhD student covers both the national and IO-BAS requirements for the specific scientific area.

### **Critical notes, recommendations and questions**

1. I would recommend the PhD student uses an editor within the text software to reduce the technical (typing) errors in voluminous text.
2. In a number of places in the text the PhD student talks about "forms", but from the context it is clear that she means species, varieties and forms. It would be correct to use the term taxon, with an appropriate explanation, where necessary. Latin names of species and genera should be written in italics throughout the entire text.
3. What could be the reason for the difference in the diatom flora of the PET strips in the Ropotamo river area? Was there the same pattern observed in the natural diatom flora on the leaves of seagrasses from the Ropotamo river area, compared to the other studied areas?
4. Is it known, or are there any observations, what could be the influence of the wind wave action on the periphyton (specifically diatoms) in our Black Sea coastal waters?

### **Plagiarism**

The PhD student declared that she presented her own original scientific results obtained by her within this research. The excellent knowledge of the topic, the analysis of the results, as well as the style of the work itself, all leave no doubt that **the work is original and fully developed by the PhD student.**

### **Conclusion**

My assessment of the PhD thesis is positive. Therefore I recommend to the esteemed jury to award Elitsa Valentinova Hineva the educational and scientific degree "Doctor of Philosophy" (PhD) in area of Higher education cipher 4: „Natural sciences, mathematics and informatics“, Research area cipher 4.3: „Biological sciences“, Scientific discipline cipher 02.22.01: „Ecology and protection of the ecosystems“, research topic „Macrophytobenthos“.

2 March 2021

Assoc. Prof. Ralitsa Zidarova, PhD