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ABSTRACTS BOOK

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Results of Phytoplankton Pigments Studies in the Zmiinyi Island Coastal Waters in the Black Sea, 2004-2012

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Abstract

It is known [1] that photosynthetic phytoplankton pigments (PSP) are the specific markers characterizing the processes taking place in marine phytoplankton and enable us to assess not only its structure, but also to estimate its biomass. At that, studies of phytoplankton using assessment of their PSP are more objective and less time-consuming compared with classic microscopy methods. The PSP is most efficient in marine areas where eutrophication happens. In particular, one of such areas is the North-Western Black Sea [2], where eutrophication not only brings down the quality of marine environment causing blooms of phytoplankton, but also causes hypoxia and mass mortalities of marine organisms. The aim of our work was to study the PSP inter-annual and seasonal changes and trends, such as Chl *a*, Chl *b*, Chl *c* and pheophytin *a* in the Zmiinyi Island coastal waters in 2004-2012.

The analysed material included PSP determination in the Zmiinyi Island coastal waters samples which the staff of Marine Research Station (MRS) "Zmiinyi island" of Odessa National I.I.Mechnikov University sampled in the framework of programme "Long-term Integrated Monitoring and Investigations of Zmiinyi Island marine ecosystem". The report shortly describes the methods of PHP concentrations measurements and routine observation of hydrological and hydrochemical parameters. The data on coastal sea waters for 2004-2012 with PSP are analyzed in detail. It is shown that in the surface layer the concentrations of Chl *a*, Chl *b*, Chl *c* were in the average higher than in the bottom layer, 1.7, 1.6 and 1.2 times respectively. The results of studies of each PSP's inter-seasonal and inter-annual changes are presented. It is shown that bimodal picture of average monthly

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concentrations distribution of Chl *a*, Chl *b*, Chl *c* has been observed, with maxima in June and November and minimal values in July and in winter period. At that, seasonal changes in the bottom layer have been more pronounced than in the surface water. The long-term and seasonal changes in ratio of three PSPs and pheophytin *a* have been studied. The results of statistical processing of observations outcomes and mutual correlative relationship between the PSPs studied are considered. For the first time we describe and analyze in detail a statistically significant trend in Chl *c* increase, whose concentration has grown almost twice for 9 years, which indicates the structural changes taking place in the Black Sea phytoplankton community during past years. It has been proposed to use Chl *c*/ Chl *a* ratio as the indicator of structural changes taking place in marine phytoplankton.

The study has been carried out in the framework of National research activities and as a contribution to the European FP7 projects ENVIROGRIDS and PERSEUS.

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References

1. Phytoplankton Pigments: Characterization, Chemotaxonomy and Applications in Oceanography, eds. Suzanne Roy, Carole A. Llewellyn, Einar Skarstad Egeland and Geir Johnsen. Published by Cambridge University Press. # Scientific Committee on Oceanic Research (SCOR) 2011. 874 p.
2. BSC, 2008. State of the Environment of the Black Sea (2001-2006/7). Edited by Temal Oguz. Publications of the Commission on the Protection of the Black Sea Against Pollution (BSC) 2008-3, Istanbul, Turkey: 448 pp.