International Science Group

ISG-KONF.COM

STUDY OF MODERN PROBLEMS OF CIVILIZATION

V SCIENTIFIC AND PRACTICAL CONFERENCE

19-23 October

Oslo, Norway

DOI 10.46299/ISG.2020.II.V

ISBN 978-1-63649-940-6

STUDY OF MODERN PROBLEMS OF CIVILIZATION

Abstracts of V International Scientific and Practical Conference

Oslo, Norway
19-23 October, 2020

TABLE OF CONTENTS

BIOINDICATION AND BIOTECHNESS OF THE MARINE ENVIRONMENT IN THE ODESSA REGION

Soborova Olha,
Ph.D. in Geographical Sciences, Associate Professor
Aquatic Bioresources and Aquaculture Department
Odessa State Ecological University

Burhaz Maryna,
Ph.D. in Biological Sciences, Associate Professor
Aquatic Bioresources and Aquaculture Department
Odessa State Ecological University

Kudelina Olha
Senior Lecturer
Odessa State Ecological University

The methods of biotesting of a quality of the marine environment of the coastal areas of the NWBS using physiological and morphological indicators of the state of the adult Black Sea mussels and their larvae have revealed that a quality of the aquatic environment for the life of these hydrobionts had improved (as compared to a previous year) in the most studied water areas [1,4,5].

In 2016 in the spring-summer period in the NWBS area there was a development of 224 species of phytoplankton, which belonged to 8 departments. The representatives of diatomaceous and dinophytic microalgae made the most significant contribution to a species diversity. In the waters of the Odessa region there was a polydominant complex of phytoplankton (212 species and varities of microalgae) with a predominance of diatomaceous species both in numbers and in a biomass. In the coastal areas the quantitative indicators of phytoplankton are higher than in the open shelf waters. High values of the quantitative indicators of phytoplankton in the coastal waters were caused by a flow of several large rivers especially the Danube River [1,4,5].

In the port area of the city of Yuzhny in the Odesa region, which occupies a water part of the Grigoryevsky estuary, especially in the vicinity of the waste water

discharges in the Gulf of Odessa, the species diversity of macrophytes is 2-2,5 times less than in the whole Odessa region. In the coastal areas mesosaprobic species of algae are dominated. A quality of the shallow water of the North Western Part of the Black Sea (NWBS) at the present stage refers to moderately polluted. With regard to the open shelf zone, here a share of oligosaprobic species is about 70% which despite the elevated level of eutrophication characterizes this area as relatively clean [1,4,7].

Historical development of the Black Sea water area and low salinity of its waters cause a sufficient variety of flora and fauna. According to the origin the biota includes: 1) the ancient relict brackish fauna, which is a remnant of the Pontic fauna; 2) the Mediterranean (in other words, the Atlantic) fauna and flora – it is like the youngest invader and now its most complete owner; 3) freshwater forms. The habitat of the zoobenthos of the Black Sea is 23% of the Black Sea area. The lower limit of a macrozoobenthic animal's distribution is located at the depths of 130 m.[1,4,5].

A quality of the coastal marine environment of the most of the surveyed water areas of the Odessa region has improved over the course of the year but it was somewhat worse for the development of the investigated hydrobionts than in 2015.

In the water area of the Odessa region there was a polydominant complex of phytoplankton species (212 microalgae species and varieties) with a predominance of diatom in both numbers and a biomass [1,5].

In the Dniester region, the average number of phytoplankton was 1003 thousand units/l^{-1}, an average biomass – 580 mg m^{-3}. The high values of the quantitative indicators in this area were due to the diatoms (*P. Delicatissima*) "bloom". The maximum "bloom" was observed in the upper layer of the water which was located on the crossroads of the Dniester estuary, which was probably caused by a pollutants inflow within the river runoff. As the river waters flow along the coast and mix with the seawater, the "blooming" moved to the deeper horizons in the direction of a distance from the coastline and was observed only on the lower boundary of the thermocline where a number of diatom (*P. Delicatissima*) mounted to 1.98 million units / l^{-1} at the biomass of 0.78 gm^{-3}.

P. delicatissima refers to the potentially toxic species, but in spite of the occasional «blooming» of this species, any humans or animals diseases that were associated with it were not observed in the study area. In the zone of mixed waters, the average indicators of a number of phytoplankton amounted to 525 thousand units / cubic meters, an average biomass 397 mg m^{-3}. In the open waters of the shelf which are the most distant from the coast, a number of phytoplankton did not exceed 150 ths units / l^{-1}, and biomass 180 mg m^3.

The quantitative indicators of phytoplankton decrease with increasing the distance from the coast and increase in the zones of the river runoff influence. This effect was the most pronounced in the upper mixed horizons and on the upper boundary of the thermocline and became smoother with increasing the depth. In the Danube area there was a difference in the quantitative indicators of phytoplankton in more than 100 times compared with the other areas of the NWBS [1,4,5].

According to the obtained results, it can be noted that in general a macrozoobenthos state is satisfactory and tends to improve the condition both in

terms of variety and in the quantitative parameters [1,4,7].

In the coastal areas of the sea after the periodic changes in macrophytobenthos mesosappropriate algal species prevail and there is some stabilization of bottom phytocoenoses. Compared to previous years a species composition of macrophytobenthos changed significantly in the region of the NWBS. Some brown algae disappeared as the most sensitive to the anthropogenic pressure. But there is a massive development of filamentous green and red algae because of the excess of the pollutants. Thus the adaptation of macrophytes to the changing environmental conditions occurs and it is expressed in a change of a structural organization and in a slight tendency to their restoration at the NWBS [1,4,5,7].

References:

1. Pentilyuk R.S., Kudelina O.Y., Soborova O.M. (2019). Assessment of the marine environment quality by the methods of bioindication and biotesting on the example of the Odesa region. Naukovij zhurnal «Vodni bioresursi ta akvakul'tura». Herson. P. 102-113.

2. Honcharov A.Yu. (2001). Hidroximichnyj rezhym i pervynna produkciya fitoplanktonu v rajoni avarijnoho vypusku stichnyx vod v Ode'kij zatoci. *Ekolohiya morya.* P. 60-70. [in Ukrainian]

3. Yeremenko T.I. (1980). Makrofitobentos (Macrophytobenthos). Kerivnyctvo po metodax biolohichnoho analizu mors'koyi vody i donnyx vidkladen" (tymchasove). Leningrad: Hidrometeo vyd-vo. P. 170-177. [in Ukrainian]

4. Kovalishyna S.P., Teren"ko H.V., Hrandova M.A., Dudnyk D.S. (2010). Stan planktonnyx i bentosnyx spil"not hidrobiontiv Odes"koho pryberezhzhya Chornoho morya. Materialy XI Mizhnarodnoyi naukovo- praktychnoyi ekolohichnoyi konferenciyi *Vydovi populyaciyi i spil"noty v pryrodnyx i antropohenno-transformovanyx landshaftax: stan i metody joho diahnostyky*. Rosiya, Belhorod, 20-25.09.2010. [in Ukrainian]

5. Materialy do Nacional"noyi dopovidi pro stan navkolyshn"oho pryrodnoho seredovyshha v Ukrayini u 2015 r. (2016). Rukopys UkrNCEM. Odesa. [in Ukrainian]

6. Materialy do Nacional"noyi dopovidi pro stan navkolyshn"oho pryrodnoho seredovyshha v Ukrayini u 2016 r. (2017). Rukopys UkrNCEM. Odesa. [in Ukrainian]

7. Orlova I.H., Pavlenko N.E., Popov Yu.Y., Ukrayins"kyj V.V., Komorin V.N. (2002). Rezul"taty doslidzhen" hidroloho-hidroximichnoho rezhymu Odes"koho portu v ramkax mizhnarodnoho proektu «Hloballast». Tezy dop. 4-j mizhnarodnyj

sympozium *Ekolohichni problemy Chornoho morya*. Odesa, OCNTI, 31.10.2002. P. 156-161. [in Ukrainian]

8. Zajcev Ju.P., Aleksandrova B.G., Mynychevoj G.G. (2006). *Pivnichno-zaxidna chastyna Chornoho morya: biolohiya, ekolohiya* (The Northwest of the Black Sea: biology, ecology). Kyiv: Naukova dumka. [in Ukrainian]