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Цей збірник наукових доповідей присвячений основним підсумкам виконання Стратегічного плану дій по реабілітації і охороні Чорного моря (1996-2000 рр.), підсумкового документа першого етапу виконання Міжнародної Чорноморської Екологічної Програми ООН. У цьому зв'язку надруковані матеріали відображають основні розділи Програми, а саме: швидке реагування при надзвичайних ситуаціях, моніторинг забруднення і стандарти якості навколишнього середовища, захист біологічної різноманітності, розробка загальної методології управління прибережною зоною моря, рибальство, освіта і громадська поінформованість в природоохоронній області. В статтях представлені результати раніше не надруковані результати наукових досліджень. Подані дані, їх інтерпретація і закінчення належать авторам повідомлень і ні в коєму разі не можуть бути приписані членам організаційного комітету, які склали даний збірник.

Збірник призначень для широкого кола спеціалістів у галузі біології і екології моря, океанографії, техногенної безпеки і охорони природи.

Відповідальні редактори: канд. біол. наук Б.Г. Александров  
канд. хім. наук Б.М. Кац  
докт. геол.-мін. наук Т.А. Сафранов

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Present issue is devoted to the main results of Strategic Action Plan for the Rehabilitation and Protection (SAPRP) of the Black Sea (1996-2000) implementation. The SAPRP is a resulting document of the Black Sea Environmental Program (GEF/UN/UNDP) first step. The published materials have been reflected by the main Program sections: emergency response, pollution monitoring and environmental quality standards, protection of biodiversity, integrated coastal zone management, fisheries, environmental education and public awareness. These papers are the results of scientific research haven't been unpublished earlier. The findings, interpretations and conclusions expressed in papers, are in own property of the authors and should not be attributed in any manner to the members of organization committee, which prepared this issue.

The issue was design for specialists in the field of marine biology and ecology, oceanology, technogenic safety and environmental protection.

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## THE ROLE OF ZOOPLANKTON IN NUTRITION OF THE BLACK SEA MUSSEL

*M.M. Danilova*

*Odessa Branch Institute of Biology of Southern Seas, National  
Academy of Sciences of Ukraine*

One of the factors determining the selection of locations and assessment of their dimensions for mussel mariculture is supply of nutrition. Thus, special attention should be paid to the role of animal food in the nutrition of the mussel as contradictory opinions on this matter have been put forth. Several authors [1,3,4,5] have observed the presence of animal food in mollusks in great quantities. Garba et al., 1977 [2] noted a slight amount in them. Others consider the lack of animal organisms in the gastric tract of mussel's [7]. The mussel, *Mytilus galloprovincialis* L., is one of the most widespread species used for mariculture in the Black Sea. The need for studying the role of zooplankton in mussel nutrition is evident.

The composition of food for nutrition was studied in mussels of the Odessa Bay, cultivated on collectors and inhabiting the seabed. Three times monthly from March 1986 till December 1989, mussel's 3-65 mm in length was sampled. Detailed studies were carried out in the summer-autumn of 1986.

When examining the food content of mussels under the microscope, whole cells or parts of microphytes and animal organisms and an amorphous mass are observed. Slides were used with material dyed with 5% erythrocin solution, which allowed to observe minute organisms.

The quantitative index of mussel nutrition was the percent ratio of food composition determined according to the restored mass of food organisms [8]. Analysis of the quantity and frequency of organisms in the food pellet was made. All of these parameters were determined simultaneously, which allowed to establish which organisms were predominating, which-substituting, secondary and random in nutrition.

Mussels were separated into three groups according to length. The composition of food pellets showed that mussels of all lengths and age groups feed on planktonic and benthic forms, both plant and animal organisms. Our

investigations have shown that mussels filter food organisms of all sizes, but particular groups make up the greatest or least fraction in the food pellet.

In the 3-19 mm group of mollusks, animal organisms predominated in the plant algae mass and frequency. Peridinea were most frequent. Among animal organisms the greatest number was made up of two species of infusorians - 71.1 %, copepods - 15.6 %. Up to 0.4 % of other copepods as harpacticoids were present. Cladocera is lacking or single cases not exceeding 2 % have been noted (Table 1). However, copepods rank first in mass - 33.6 % and in frequency - 49.9%. Other crustaceans are significant as ostracods where frequency is 20 %. The mass of infusorians declines slightly (39.3 %), and frequency rises (45.2 %). Infusorians predominate in the food pellet.

Of plant organisms significant as food was the peridinian - *Prorocentrum micans* in mass - 37.3 %, and 64.4 % of the total number of algae in the mussel. The ratio of plant and animal components for juvenile groups of mussels is similar.

The second group of 20 - 45 mm mussels has a wider food spectrum. The number of animal species increases. The role of crustaceans in animal nutrition increases due to mass and frequency - 60.5 and 120 %, correspondingly. Often animal eggs are present (24.2 %). Animal organisms as radiolarians, turbellarian larvae, bryozoans are encountered from 1 to 4.5 %.

Peridinian and diatom algae made up the plant food, the former *Prorocentrum micans* dominating with number of cells making up 65.9 % and mass - 37.5 % *Coscinodiscus* mass makes up 23.5 %. The rest of the peridinians, diatoms, blue-green, and green algae make up 1 - 7.6 % of the food and are secondary. The ratio of average animal and plant organisms was 60 : 50.

The third group of mussels included those of 46 - 65 mm length. The food spectrum in this group is more narrow, but there is a large diversity of both animal and plant organisms. Mollusks feed on large crustaceans in the first stages of development. In the autumn period (September - early October), large organisms predominate as in the second group. In mass the composition of food was mostly of copepods - 32.4 %, cladocerans - 29.0%. However, more frequent were tintiniid species, *C. helix* and *F. ehrenbergi* (47.0 %; 11.8 %). Their moiety in the food pellet was 63.3 %. Copepods in the food pellet dominate in frequency and in number - 39.3 %. Decapods make up 7.8 %. The role of other animal organisms in mussel nutrition is insignificant (0.5 - 6.0 %).

Of plant organisms predominating in mass in mussel nutrition are diatoms - *Coscinodiscus* - 29.9 %, *Melosira* - 11.3 %. The mass of the peridinean *P. micans* was 24.3 %. Other algae are less frequent (0.1 - 7.2 %).

Significantly greater frequency was noted in peridineans - 60.8 % and 82.6 - abundance. In spite of the diversity of species composition in the Odessa Bay [6] only one species of peridineans *P. micans* has been encountered in the mussel stomachs.

When analyzing the food spectrum of the Black Sea mussel, the presence of bacteria, detritus, particles, fungi etc. should be noted.

Our studies have shown that in Odessa Bay mussels have a wide food spectrum. The main food for them, especially in the summer-autumn period, is zooplankton and zoobenthos.

The food spectrum of mussels of different length groups varies. However, a small group of organisms has been revealed as rotatoria, larvae of turbellarians, mollusks, radiolarians, bryozoans which do not take part in the trophic cycle of mollusks.

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