

DYNAMICS OF BACTERIOPLANKTON OF THE FISHERIES POND OF THE VILLAGE OF KARAPCHIV OF THE STOROZHYNETSKY MILITARY FORESTRY

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Microorganisms are mandatory inhabitants of fresh and salt water, which play a key role in their life, ensuring closed cycles of basic biogenic elements. All taxonomic groups of bacteria, protozoa, and algae are isolated in fresh and salt water. The totality of all water microorganisms is designated by the term "microbial plankton". Its qualitative composition depends on the season, meteorological factors, the degree of remoteness of the reservoir from populated areas, the chemical composition of the source, the nature of the soil of the banks, the presence and composition of hydrobionts, and the sources of pollution. The widespread distribution of microorganisms is explained by exceptional endurance in adverse conditions, the ability to easily adapt to various environmental factors, rapid reproduction and small size. Microorganisms determine the direction and intensity of energy flows and the circulation of substances between trophic chains of different levels, the final link of which is fish production. Their most important functions are the destruction and mineralization of suspended and soluble organic substances, the formation of the hydrobiological regime, they are of great importance in the self-purification of water bodies. Bacteria participate in the food chains of fish ponds, are an important source of nutrition for planktonic and benthic invertebrates and most fish species in the early stages of ontogenesis, and affect water quality.

Bacterioplankton are single-celled representatives of the domains *Bacteria* and *Archaea*, which consists of bacteria of different physiological groups, it depends on the presence of organic substances, temperature and oxygen regime, salt composition and other factors.

Bacterioplankton occupies a number of ecological niches in marine and aquatic ecosystems. They are both the main producers and the main consumers in these ecosystems and control the global biogeochemical cycle of elements necessary for life (for example, carbon and nitrogen). Many species of bacterioplankton are autotrophic and obtain energy as a result of photosynthesis or chemosynthesis.

The abundance of bacterioplankton is controlled by filter-feeding animals, sometimes by those that clean the water from sediments, and the abundance depends on environmental factors such as temperature, nutrient availability, and predation. The purity of water depends on the efficiency of bacterioplankton removal, and not on the possibilities of its development.

Bacteria are of great importance in the production and self-cleaning processes of water bodies and are an important source of nutrition for planktonic and benthic invertebrates and fish in the early stages of development. In reservoirs rich in organic substances, bacteria reproduce very quickly and can accumulate in large quantities. Various organic and mineral fertilizers are used in the technological processes of fish farming in order to increase the level of development of the fodder base, which are primarily used by bacteria. At the same time, their number can reach significant values, causing a significant decrease in oxygen dissolved in water, which often leads to "suffocation". However, with strict observance of the technological requirements for the use of fertilizers, the development of bacterioplankton and its eating by hydrobionts at the following trophic levels occurs mainly at the level of reproduction.

The purpose of this work was to determine the dynamics of bacterioplankton in the fishing pond of the village of Karapchiv of the Storozhynetsky military forestry.

The tank is located within the forest zone, on the military territory of the village of Karapchiv, and is designed to store fire-fighting water supplies. The length of the pond reaches 550 m, the width is 300 m, and the average depth is 1.5 m. The pond has a mixed type of nutrition: it is replenished by melted snow water in the spring, by rain water in the summer, and by underground

water all year round. The highest water level is observed in March and April, when the snow melts, as well as in the first half of summer, when it often rains. During floods, the water level can rise by 10-50 cm per day. The lowest water level in the pond is August-September, when there is little precipitation. The pond belongs to water bodies with weak water exchange. In such a reservoir, microorganisms are distributed relatively evenly horizontally. Strong winds of a constant direction can change the natural distribution of microorganisms in water. The number of microorganisms in water changes during the day depending on the effect of the temperature factor, light, as well as hydrochemical parameters. The number and distribution of phytoplankton and zooplankton will also have a direct effect on the number and diversity of bacterioplankton.

To assess the level of development of bacterioplankton, the total number of bacteria, their biomass, and the number of heterotrophic (saprophytic) bacteria, which are indicators of water pollution with readily available organic substances, were determined.

Water samples to determine the number of bacterioplankton were taken from four reference points, which were distinguished by the intensity of overgrowth of the shoreline, depth, and contamination with organic remains (branches, fallen leaves) of the water mirror. The selection was carried out during 2022-2023.

Sterile test tubes or sterile polyethylene bags were used for sampling, which were then closed with rubber caps. Cultures were carried out no later than 1-3 hours after sampling. Nutrient agar (MPA) was prepared according to the prescription, poured into Petri dishes in a thin layer 0.3 cm thick. From each sample, 1 ml of test water was taken and distributed over the surface of the medium with a Drygalsky spatula. After three days of cultivation at a temperature of 37 °C, the number of colony-forming units was counted.

Microorganisms are unevenly distributed in water bodies, there are more of them near the shores, less at depth. Thus, at all reference points, the maximum amount of bacterioplankton was noted in September and March, the lowest amount during the winter period (December). It is obvious that this is related to seasonal temperature fluctuations, as well as to the components of the pond's nutrition.

As you know, the main source of energy for bacteria is dissolved organic matter, as well as mineral forms of nitrogen and phosphorus. Bacteria reach their maximum development during periods of dying off and decay of phytoplankton, which accumulates in reservoirs during its growing season. The first and third reference points are characterized by a slight overgrowth of coastline vegetation and a significant depth of occurrence. The maximum number of colony-forming units for these water samples is determined within 50 KUO/ml. An increase in available organic raw materials (as observed at the second and fourth reference points) leads to an increase in the number of bacteria in the water by 140 - 180 KUO/ml. It is known that the number of bacteria in water depends on the season, which was also noted by our research. Regardless of the location of the reference point, the maximum amount of bacterioplankton in this reservoir was observed from June to October. However, this amount was no more than 2.3×10^4 KUO/m³.

The obtained results give reasons to consider the fishing pond of the village of Karapchiv of the Storozhinetsk military forestry as a clean water body.

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