

# Environmental Assessment of The State of the Hydrobiocenosis Communities of the Muynak Bay of the Southern Aral Region

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**Abstract:** This article examines the state of hydrobiocenosis communities and the chemical composition of the water of the Muynak Bay of the Southern Aral Sea. Assessment of changes in the composition of phytoplankton, zooplankton, zoobenthos and ichthyofauna

**Keywords:** Environmental conditions, water mineralization, pH type of salinity, dry residue, non-toxic salts, less harmful toxic salts, the most harmful toxic salts a variety of hydrobionts

The total area of the Muynak Bay is 9.75 thousand hectares. However, according to satellite images, its area is much smaller and in high-water years its value does not exceed 3–4 ha. The source of water supply for the lake is the Glavmyaso canal, which originates from the Mezhdurechensk reservoir. The maximum depth reaches up to 3.5 m, but the water depth of most of the territory is 0.5 - 0.7 m. The northern part near the city of Muynak is a bay of water, and represents numerous shallow overflows. Thickets of large vegetation are observed on open elevated elevations. Enclosing dams 6.5 km long and temporary catchment facilities were built in the western part. In recent years it increases (especially in dry years) and reaches 3.5-4.0 g/l, and in high-water years it decreases to 2.5-3.0 g/l. Despite such a high mineralization, the water in the lake is suitable for all types of fisheries.

Along the border of the reservoir there are the cities of Muynak and Uchsay with a densely populated area with large labor resources, which have been engaged in the fishing industry traditional for these places for centuries, and therefore the Muynak Bay is of great economic, recreational and ecological importance. Considering this, it is necessary to increase the area of the reservoir by completing the construction of the southern dam with outlet facilities. In order to increase the water supply of the zone, it is necessary to reconstruct the Glavmyaso canal.[1] At present, Muynak Bay is a slightly desalinated body of water with salinity changing seasonally. marine and small. Thickets of these plants occupy 80-85% of the area of the bay.

Muynak Bay is an artificial reservoir in the delta zone of the Amu Darya, which, for fisheries and recreational purposes, was recreated in the bed of the former bay of the same name in the Aral Sea due to watering with the waters of the Amu Darya. However, in general, the species composition of the ichthyofauna is extremely depleted, the reproduction of native species is limited. 19 species are known in the composition of the fish population, most of them are acclimatized, of which only 5 are of commercial importance. with river waters. Many natives (pike, sabrefish, rudd, perch) have practically not been found in recent years.

The ecological conditions of the Muynak Bay, while maintaining the water area and water level, are favorable for native carp phytophilic fish species and their feeding. Of the acclimatizers in the bay, there are areas with conditions for feeding herbivorous fish, especially for grass carp and white Amur bream. Snakehead also has breeding conditions here and fattening. The conditions of the reservoir for feeding silver carp are less favorable due to shallow water and high overgrowth.

**Table 1**  
**Seasonal abundance of the floristic composition of phytoplankton in Muynak Bay**

Отдели	Spring	Summer	Autumn	Winter
Суанопхита	52	106	85	27
Chrysophyta	2		1	3
Bacillariophyta	130	198	154	113

Xanthophyta	1		1	
Dinophyta	13	24	20	6
Chrysophyta	2		3	1
Euglenophyta	11	30	25	2
Chlorophyta	47	115	92	10
Volvocophyceae	6	5	7	2
Protococccophyceae	26	82	61	6
Ulothrichophyceae	5	7	6	1
Conjugatophyceae	10	21	18	1
Bcero	258	473	381	162

*A.E. Elmuratov (1996-2) Assessment of changes in the phytoplankton composition of the Muynak Bay of the Aral Sea and its ecological features*

In terms of the development of zooplankton and zoobenthos, the bay belongs to low-feeding water bodies. The average total biomass of zooplankton is within 3.4-33.4 mg/m<sup>3</sup>, zoobenthos is up to 4.49 g/m<sup>2</sup>. The reason for the low indicators of the food base for fish is the instability of the water regime, drying of large areas and the development of hyalostatic processes in shallow waters. However, with low levels of zooplankton and benthos, the reservoir has huge resources of aquatic vegetation, allowing the development of productive populations of herbivorous and detritivorous fish when their juveniles enter with river runoff. [3]

The most important conditions that determine the life of aquatic organisms are temperature, illumination, gas regime, salinity, and the content of biogenic substances dissolved in water. Therefore, when breeding fish in water bodies, it is necessary to control these parameters, by suppressing or maintaining the hydrochemical processes occurring in them, it is possible to create a favorable regime for growing fish. Temperature indicators for successful breeding of fish are in the range of 19-29°C.

Water mineralization or salinity are also important factors in fish breeding. The amount of salts in water can be determined using a salt meter or chemically. When breeding fish, the optimum salinity of water is 5-12 g/l. Salinity indicators can also serve as certain types of plants that grow on the banks of the pond. Reeds, reeds, and pondweeds usually grow in brackish waters. [4]

**Chemical composition of water in the water bodies of the Aral Sea region (g/l/mg/ekv)**

water body	dry residue %	CO <sub>3</sub> <sup>-</sup> B % mg/ekv	Total HC O <sub>3</sub> <sup>-</sup> in % mg/ekv.	CL <sup>-</sup> % mg/ekv	SO <sub>4</sub> <sup>-</sup> % mg/ekv	Ca % mg/ekv	Mg % mg/ekv	Ани оны-кати оны % mg/ekv	Na+K по разности		Sum of components in %	salinity type	Note	pH
									mg/ekv	%				
Muynak Bay (the soil)	1.463	-	<u>0,07</u> 3 1,2	<u>0,0</u> 89 2,5	<u>0,8</u> 28 17, 25	<u>0,1</u> 30 6,5	<u>0,</u> 082 6, 75	<u>20,9</u> 5 13,2 5	7,7	0,177	1,379	sulfate	Medium saline soil	8,0
Muynak Bay (water)	6,695	-	<u>0,34</u> 2 5,6	<u>0,6</u> 39 18, 0	<u>3,7</u> 92 79, 0	<u>0,8</u> 62 43, 0	<u>0,70</u> 5 58,0	<u>102,</u> 6 101, 0	1,6	0,040	0,707	chloride sulfate	medium saline water	8,0

The level of mineralization is an important environmental factor, in largely determining the diversity and quantitative development of hydrobiont- of continental water bodies, especially arid zones. Diversity aquatic organisms maximum in fresh waters, then significantly decreases (with a shift in the composition of the community) with an increase in mineralization in the hypogal linear range.

The conducted studies showed that the water of the Muynak Bay Lake has a high mineralization, pH-8, salinity type (chloride-sulphate), dry residue 6.695%, non-toxic salts Ca(HCO<sub>3</sub>)<sub>2</sub>-0.454%, CaSO<sub>4</sub>-2.545%, less harmful toxic salts % - NaCl-0.097%, the most harmful toxic salts MgSO<sub>4</sub>-2.502%, MgCl<sub>2</sub>-0.782%.

Thus, various cations (calcium, magnesium, sodium, potassium, iron, etc.) are also necessary for hydrobionts, and if they are sufficient in the composition of mineral salts in water, the normal development of organisms. Aquatic animals (mollusks, some fish) and plants are ecologically adapted to acidic environment, but this environment has a negative impact on many species and their growth, reproduction and distribution slow down, even stop, and the organism dies. The general mineralization of lake waters and their composition are the most important ecological factor in the development and distribution of hydrobionts.

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