

# Influence of an Unstable Hydro Regime of Reservoir Bodies of The South Aral Region on the Species Diversity of Higher Aquatic Vegetation

Askar Bekbaulievich Bektursynov

Assistant Teacher, Nukus State Pedagogical Institute,  
Nukus, Karakalpakstan, Republic of Uzbekistan



## Abstract

The species diversity of the hydrophilic flora of reservoirs located within the Southern Aral Sea region was studied: Muynak Bay, Sarbas, Shegekul, Koksul, the dynamics of higher aquatic vegetation in conditions of unstable hydraulic regime in the period 2009-2023. The overgrowth of reservoirs under conditions of unstable hydraulic regime was studied.

**Keywords:** Southern Aral Sea region, Muynak Bay, Sarbas, Shegekul, hydroregime, higher aquatic vegetation, water milfoil, pondweed.

## Introduction

Due to changes in the hydrological and hydrochemical regime in reservoirs, different ecological conditions are created for aquatic plants. Managing the hydrological regime of water bodies can serve as a factor in the transformation of ecosystems. Higher aquatic vegetation is the main environment-forming component of reservoirs, and studying their floristic composition and dynamics under conditions of changing hydrological regime is important.

The degree of mineralization of water, which directly depends on the hydraulic regime of this reservoir, is of great importance for the overgrowth of reservoirs. With an increase in water salinity in a reservoir, not only does the floristic composition change, but also all freshwater plant communities gradually disappear.

## Purpose of the Study

Study of the species diversity of higher aquatic vegetation, dynamics under conditions of unstable hydraulic regime of reservoirs of the Southern Aral Sea region: Muynak Bay, Sarbas Bay, Shegekul, Koksul.

## Material and Research Methods

The research was carried out in spring and summer, the collection and study of herbarium materials of higher aquatic plants was carried out in the reservoirs of Muynak Bay, Sarbas, Shegekul according to the methods of V. M. Katanskaya [1] and L. I. Lisitsina [2]. Plants that grew in water or at the bottom of a water basin were selected manually, and plants growing in the depths of water were selected using hooks of different lengths. Previously published sources were used to determine the species composition. In determining the species composition and taxonomic analysis, monographs “The Key to Plants of Central Asia” were used (1968). [3–7].

## Research Results and Discussion

Low water supply, insufficient water supply and drying out of a large part of the water area of reservoirs leads to a depletion of the species composition of the flora of higher aquatic plants and the distribution of only some species that reproduce quickly, for example, hornwort, urut, pondweed species, and chara algae.

It was noted that the rapid development of charophyte algae occurs when flood water does not enter the lake and the hydrological regime of water exchange is disrupted. If lakes remain in this state for 1-2 years, the water in them begins to mineralize, and the khara and comb pondweed *Potamogeton pectinatus* begin to increase their thickets [8].

Instability of water supply can lead to the gradual disappearance of plant species that are more demanding of a stable hydraulic regime and are sensitive to changes in water levels and frequent drying out of reservoirs. The years 2000-2001, 2008, 2011, 2018 and 2021, 2022 were especially critically low-water years, when the supply of Amudarya water was insufficient to maintain the water level in the reservoirs of the Southern Aral Sea region. As a result, many reservoirs (Muynak Bay, Sarbas, Shegekul, Koksu, Domalak) became very shallow, and some dried up.

The overgrowth of most water bodies with submerged plants is very high. The most dominant species from the submerged plants are *Myriophyllum spicatum* and *Potamogeton crispus*. In spring and summer, *M.spicatum* and *P.crispus* in the Muynak Bay and Sarbas form continuous, dense thickets, which even impede movement by boat [9].

The reservoirs of the Southern Aral Sea region are characterized by a relatively small number of species of higher aquatic plants. Even heavily overgrown reservoirs are represented by only a few species of higher aquatic plants.

The most common water-submerged plants are *Myriophyllum spicatum*, *Potamogeton crispus*, *Potamogeton perfoliatus*, *Potamogeton pectinatus*, *Najas marina*, *Ceratophyllum demersum*. Shallow-water spills are covered with low thickets of cattails *Typha angustifolia*, *Schoenoplectus litoralis*, *Acorellus pannonicus*, *Bolboschoenus maritimus*. In low-water years, the coastal parts of the lake are covered with thickets of comb grass.

Conclusions. The reservoirs of the Southern Aral Sea region (Muynak Bay, Sarbas, Shegekul, Koksu) are characterized by strong overgrowth, but species diversity is not numerous. The predominant species from submerged plants are *Myriophyllum spicatum* and *Potamogeton crispus*. In spring and summer, *M.spicatum* and *P.crispus* form continuous, dense thickets in reservoirs, especially in the Muynak Bay and Sarbas.

The most widespread species in many reservoirs are those that, by their biology, are most adapted to the hydrological regimes of reservoirs and, under favorable conditions, are capable of forming dense thickets. These are mainly submerged hornwort, spicate hornwort and curly pondweed. Brackish water bodies are characterized by comb pondweed and naiads.

## References

1. Katanskaya V.M. Higher aquatic vegetation of continental reservoirs of the USSR. – L.: Nauka, 1981. -187 p.
2. Lisitsyna L.I. Herbarization of aquatic plants, design of collections // Hydrobotany: methodology, methods: materials of the school on hydrobotany (Borok village, April 8-12, 2003). Rybinsk: Rybinsk Printing House, 2003. pp. 49-55.
3. Flora of Uzbekistan. 1941-1963. Tashkent, I-VI t.
4. Key to plants of Central Asia. 1968-1993. Tashkent, I-X volume.
5. Rychin Yu. V. 1948. Flora of hygrophytes. Moscow, 448 p.
6. Cherepanov S.K. Vascular plants of Russia and neighboring states (within the former USSR). Moscow, 1995. 556 p.
7. Prator O. P., Nabiev M. M. Modern systems of higher plants of Uzbekistan. Tashkent, 2007. 62 p.
8. T. Taubaev. Flora and vegetation of water bodies of Central Asia and their use in the national economy. T.: 1970.
9. A.B. Bektursynov, A.R. Tleuov. Dynamics of vegetation of Sarbas Bay // Materials of Int. scientific and practical conf. “Problems of rational use and protection of natural resources of the Southern Aral Sea region”, (July 17-18, 2018). Kk department ANRUz, Nukus, 2018