

## FISH FAUNA OF LAKE DENGIZKOL

**Buriyev Sulaymon Buriyevich**

BuxDU Professor

buriyev46@mail.ru

**Shodmonov Feruzjon Qamariddinovich**

BuxDU doctoral student (PhD)

feruzshodmonov302@gmail.com

**Okilova Gulzoda Akmalovna**

Master of Bukhara State University

### Annotation

The article describes the ichthyological study of Dengizkul Lake which is the largest one in Bukhara region as well as its water supply, hydrochemical composition of water, ichthyofauna and its development, its condition in different years, the importance of fishery, bioecological characteristics of fish species that are fished or not fished.

**Keywords:** Dengizkul, ichthyological research, formation of ichthyofauna, water supply, chemical composition of water, fish species, fishing.

### INTRODUCTION

The early ichthyological research in the Zarafshan River began in the late nineteenth and early twentieth centuries. These studies were conducted by Russian scientists N.A. Severtsov (1873), M.N. Bogdanov (1882), K.F. Kessler (1877), L.S. Berg (1948, 1949a, 1949b), G.V. Nikolskiy (1940), R. Tleuov and Sh. Tleuberganov (1974) and by other researchers [2], [3], [4], [11], [12], [14].

The lower course of the Zarafshan river consists of the main water basins such as Tudakul, Kuyimazor, Shurkul reservoirs and Dengizkul, Tuzkan, Karakir, Shurgak, Ayoqogitma lakes. The study of their ichthyofauna, its formation, the biology of fish, ecological features and other issues have been studied by a number of scientists, including M.A. Abdullaev (1989), G.K. Kamilov (1994), G.M. Sayfullaev (1995), D.S. Niyozov (2007), Z.A. Mustafoeva (2018), they studied the characteristics of different types of waters in terms of ichthyofauna and fishery management [1], [5], [10], [13], [20].



*Figure 1 Map of the sea*

## Methodology

The study and analysis of fish samples collected from the Dengizkul was conducted in accordance with general methods [6], [7], [8], [9], [16], [17], [18]. Combined nets of different eye sizes (№22-45) and fish samples caught in fishermen's nets were used to catch fish. Non-fished species were caught using a 60 cm diameter net. In the process of identifying fish species and naming them, L.S. Berg [2], R. Fricke, W.N Eschmeyer [16], The Red Book of the Republic of Uzbekistan [19], I.M. Mirabdullaev, U.T. Mirzaev, A.R. Kuzmetov, Z.O. Kimsanov's determinants were used [6], [7], [8], [9].

## Research Results

The Dengizkul lake system is currently a fishery due to the processes of privatization and denationalization in 2004 and has currently divided into 6 contours [15]. The first contour is an area of 534 hectares, which is connected to the Dengizkul collector and the reserve (emergency) canal of the Amu-Bukhara canal (Figure 1). The second contour covers an area of 1550 ha and consists of two (Oynakul, Jiydakul) small lakes (Figure 1). The third contour is an area of 1000 hectares, most of which corresponds to the water intake of the large Dengizkul area.

A branch of the Amu-Bukhara canal is connected to this contour as a storage (emergency) canal (Figure 1). The fourth, fifth, and sixth contours are in the large Dengizkul water area and have no clear boundary (Figure 1). These contours are connected to each other due to water intake networks (water inflow to each other can vary depending on the seasons and the amount of water). It is important to classify Dengizkul Lake and adjacent lakes as permanent and variable in terms of water intake sources.

It can be seen that the species composition of the lake ichthyofauna of Dengizkol Lake shows different indicators in different years [Figure 2].

A systematic analysis of the ichthyofauna of Lake Dengizkul in 2022, revealed the existence of species belonging to 6 families. 70% (12 species) of fish species represented Cyprinidae,

and 6% (1 species) Siluridae, Percidae, Poecilidae, Cobtidae, and Channidae families (Figure 2).

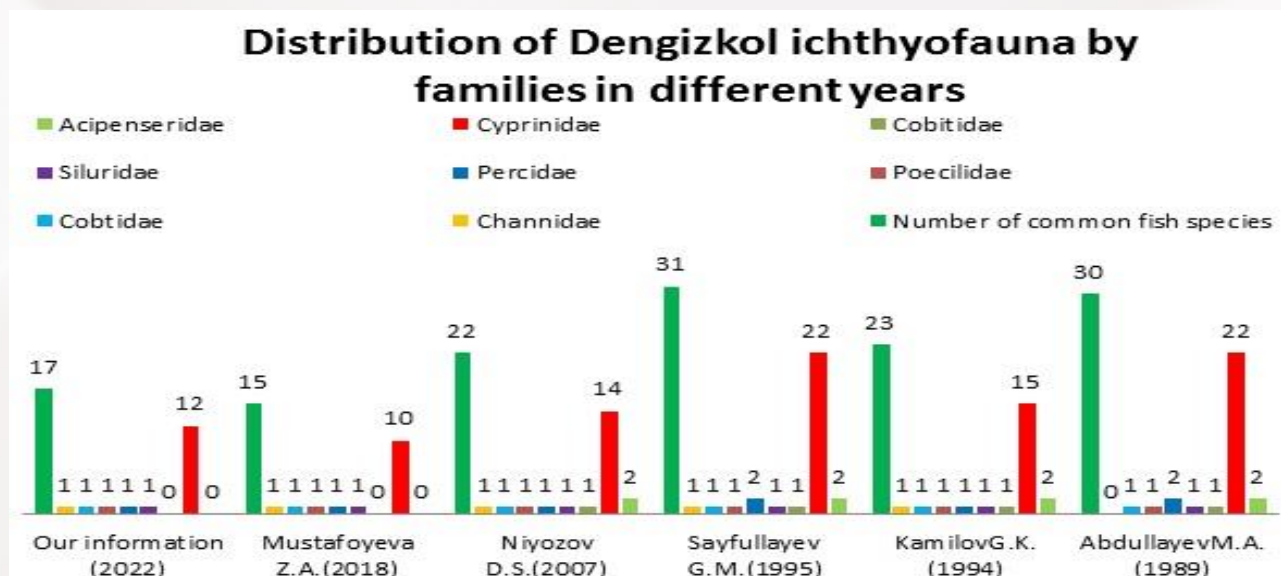


Figure - 2

Currently, 17 species of fish can be found in the Dengizkol natural water basin, and among the main fish species of hunting importance are *Cyprinus carpio*, *Silurus glanis*, *Channa argus warpachowskii*, *Carassius auratus gibelio*, *Rutilus rutilus aralensis* herbivorous *Hypophthalmichthys molitrix*, *Ctenopharyngodon idella* (Table 1)

Table 1 Contour distribution of Dengizkol ichthyofauna

№	TYPES OF FISH	Fishing place					
		1-contour	2-contour	3-contour	4-contour	5-contour	6-contour
1	* <i>Rutilus rutilus aralensis</i> (Berg)	+	+	+	+		+
2	* <i>Ctenopharyngodon idella</i> (Valenciennes)	+	+				
3	<i>Gobio gobio lepidolaemus</i> (Kessler)	+	+	+	+		+
4	* <i>Alburnus chalcoides aralensis</i> (Berg)	+		+			
5	<i>Alburnoides bipunctatus eichwaldi</i> (De Flippe)	+	+	+			
6	<i>Pseudorasbora parva</i> (Temminck et Schlegel)	+	+	+	+	+	
7	* <i>Abramis brama orientalis</i> (Berg)	+		+			
8	* <i>Carassius auratus gibelio</i> (Bloch)	+	+	+	+	+	+
9	* <i>Cyprinus carpio</i> (Linnaeus)	+	+	+			
10	* <i>Hypophthalmichthys molitrix</i> (Valenciennes)	+	+				
11	<i>Abbottina rivularis</i> (Basilewskiy)	+	+	+	+		+
12	<i>Hemiculter leucisculus</i> (Basilewsky 1855)		+	+			
13	* <i>Silurus glanis</i> (Linnaeus)	+	+	+			
14	* <i>Sander lucioperca</i> (Linnaeus)	+	+	+			
15	<i>Gambusia holbrooki</i> (Girard)	+	+	+	+	+	+
16	<i>Rhinogobius brunneus</i> (Temminck et Schlegel)	+	+	+	+	+	+
17	* <i>Channa argus warpachowskii</i> (Berg)	+	+	+			
	<b>TOTAL:</b>	<b>16</b>	<b>15</b>	<b>15</b>	<b>7</b>	<b>4</b>	<b>6</b>

**Note- \* this mark is to show hunted species**

If we pay attention to the water supply of the Dengizkul, the water supply of different contours and the instability of the associated hydrochemical composition also determine the variability of the current ichthyofauna. In particular, the increase in collector water in the 1st contour of the lake lasts from late autumn to early spring and consisted of *Alburnus chalcoides aralensis*, *Pseudorasbora parva*, *Rutilus rutilus aralensis*, *Carassius auratus gibelio*; in the ichthyofauna formed in the first half of spring by Amu-Bukhara canal: fish such as *Ctenopharyngodon idella*, *Abramis brama orientalis*, *Hypophthalmichthys molitrix*, *Sander lucioperca*, *Channa argus warpachowskii* fall more into the fishing nets. This condition is also characteristic of contour 3 of the natural water basin, with the exception of fish species such as *Ctenopharyngodon idella* and *Hypophthalmichthys molitrix* (Table 1).

The water supply of the 2nd contour of the Dengizkul natural water basin is directly related to the collector water coming from the Republic of Turkmenistan. Also, the 2nd contour ichthyofauna was formed at the expense of the Turkmen collector. The formation of collector water, in turn, depends on the groundwater system of agricultural lands of Turkmenistan and the system of irrigation canals that supply them with water. Therefore, in this contour: *Hemiculter leucisculus*, *Rhinogobius brunneus*, *Abbottina rivularis*, *Channa argus warpachowskii*, *Abramis brama orientalis* are seasonally encountered.

There is also a relative variability in the formation of the 3rd contour ichthyofauna of the lake, which is of seasonal importance. In particular, due to the constant inflow of water from contour 1, the similarity in the ichthyofauna of these contours is obvious. Due to water management in the Amu-Bukhara canal (seasonal technical training at Hamza I and Hamza II pumping stations) the composition of the ichthyofauna of the 3rd contour shows similarities with the ichthyofauna of the Amu-Bukhara canal. Accordingly, many species of fish can be found in both water basins, such as *Abramis brama orientalis*, *Rutilus rutilus aralensis*, *Carassius auratus gibelio*, *Sander lucioperca*, *Alburnus chalcoides aralensis* [22].

The 4th contour of the Dengizkol natural water basin is a direct continuation of the 3rd contour, and the 5th and 6th contours are connected to these contours without borders.

Fish species of this contour include *Gambusia holbrooki*, *Pseudorasbora parva*, *Gobio gobio lepidolaemus* [25].

Based on the above, it can be said that the variability of the ichthyofauna of Lake Dengizkul in different years is directly related to the water supply of the lake, and the large discharge of water through the Amu-Bukhara canal enriches the diversity of species. This is confirmed by the predominance of local species that enter or form through the Amudarya due to the maximum inflow of canal water in the 1st and 3rd contours of Lake Dengizkul, the formation of which is closely linked to the ichthyofauna of the Amudarya. The relative increase in water mineralization has been significant over the last 5 years can be seen in our and Z.A. Mustafayeva's research. The increase in species diversity compared to the contours of the ichthyofauna species composition of the main water area of Dengizkul Lake is slightly lower

in the contours 5 and 6, where the salinity is highest, while in the areas where the lake enters the water[25].

## References

1. Abdullaev M.A., Urchinov D.U. Commercial fish of reservoirs of the lower reaches of the river. Zarafshan. - Tashkent: Sub. 1989.
2. Berg L.S. Freshwater fishes of the USSR and neighboring countries. - M.-L.: Ed. Academy of Sciences of the USSR, 1948-1949. Ch. 1-3. – S. 1-1382
3. Bogdanov M.N. Essays on the nature of the Khiva oasis and the Kyzylkum desert. - Tashkent, 1882, 155 p.
4. Kessler, K.F. Fish found and found in the Aral-Caspian-Pontic ichthyological region. - St. Petersburg, "M. Stasyulevich", 1877, 360 p.
5. Kamilov G.K., Karimov B., Khakberdiev B., Salikhov T., Kamilov B., Pridatkina N.V., Abdullaeva L., Taraskin A., AlMajid Z., Yuldashev M., Nazarov M., Gerasimova O.D. Reservoirs of Uzbekistan (without Karakalpak) and their fishery importance. Tashkent, University, 1994. 135 p.
6. Mirabdullaev I.M., Kuzmetov A.R., Kurbonov A.R. "The diversity of fish in Uzbekistan" Tashkent, "Classic", 2020, 112 b.
7. Mirabdullaev I.M., Mullabaev N.R. Ichthyofauna of Uzbekistan: taxonomic composition and current state // Uzbek biological journal, 2020, 5, 43-49.
8. Mirabdullaev I.M., Mirzaev U.T., Kuzmetov A.R., Kimsanov Z.O. Fish identifier of Uzbekistan and neighboring regions. - Tashkent: Sano-standart, 2011. - 107 p
9. Mirabdullaev I.M., Kuzmetov A.R. Systematics of fishes of Uzbekistan. Tashkent. Editorial. 2021. 102 b
10. Mustafaeyva Z.A., Mirzayev U.T., Species of hydro bionts of lakes of Bukhara region of Uzbekistan. (East European Scientific Journal) # 4 (32), 2018. 9-16.
11. Nikolsky G.V. Fish of the Aral Sea. Moscow, 1940, 216 p.
12. Severtsov N.A. Vertical and horizontal distribution of Turkestan animals" Ova of lovers of natural science, anthropology and ethnography. T. 8, no. 2. - Moscow, 1873. - 157 p.
13. Sayfullaev G.M. Biology of commercial predatory fish species, Lower reaches of the Zarafshan river basin. Tashkent. LAMBERT 2020. 97 p.
14. Tleuov R., Tleubergenov Sh. Fishes of Karakalpakia. Nukus, "Karakalpakstan", 1974. 96 p.
15. Scientific report on the economic contract 04/10-11 dated April 07, 2011. "Certification of the most important fishery reservoirs of the Republic of Uzbekistan as an element of environmental monitoring" // Tashkent: 2011.3-78 p.]
16. Fricke, R., Eschmeyer, W. N. & Van der Laan, R. (eds) 2020. Eschmeyer's Catalog of Fishes: genera, species, references. Version 2020/11.

17. Kottelat M. & Freyhof J. Handbook of European freshwater fishes. Berlin, Kottelat, Cornol & Freyhof, 2007. xiv + 646 pp. 4-8 s.
18. Nelson J.S., Grande T.C., Wilson M.V.H. Fishes of the World. 5th Edt. Hoboken, New Jersey, John Wiley & Sons, Inc., 2016. 745 pp
19. Red Book of the Republic of Uzbekistan, Volume II: Animals; J.A. Under the general editorship of Azimov. - T: Chinor ENK. 2017, 106-126.
20. Husenov S.Q. Niyazov D.S. Fishing. –Tashkent: Publishing House of the National Society of Philosophers of Uzbekistan, 2013.-336 p.
21. Toshov Kh.M., Shodmonov F.K. Eutrophication position of fishery lakes in the Bukhara region Scientist of the XXI century. Russia. 2017. No. 1. - S. 28-31.
22. Shamsiyev N.A., Kuzmetov A.R., Mirzayev U.T., Shodmonov F.Q., Abdinazarov H.Kh., Toshov H.M. Morpho-Ecological Features of Pikeperch (*Stizostedion Lucioperca*) In Lakes of Ayakagytna in Uzbekistan. Turkish Journal of Computer and Mathematics Education. Vol.12 No. 11 (2021), 3471-3478. SJR0.148 / SNIP0.082.
23. Shodmonov F.Q., Esanov H.K., Kobilov A.M. High Plant Species Distributed in and around Dengizkul, Bukhara Region // American Journal of Plant Sciences 2021. - No. 12. - R. 266-273.
24. Buriev S.B., Shodmonov F.K., Esanov H.K. Reproduction of microscopic algae and higher aquatic plants in the waters of Dengizkul, Bukhara region // "CHRONOS" Multidisciplinary sciences. 2021. - No. 6. - P. 4-7.
25. Shodmonov F.K., Toshov H.M., Yuldoshov L.T. The Current Condition of Ichthyofauna of Dengizkul Natural Water Basin// Jundishapur Journal of Microbiology Vol. 15, No.1 (2022) pp 5933-5944.