

# QUALITATIVE AND QUANTITATIVE DEVELOPMENT OF ZOOPLANKTON ORGANISMS IN FERGANA VALLEY WATER RESERVOIR

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**ABSTRACT:** The article deals with quantity and quality indicators of Fergana Valley water reservoir. Totally 24 different zooplanktons were defined, 11 species of which are Rotifera, 6 species of Cladocera and 7 species of Copepoda. The law of seasonal spread of these organisms were studied.

**Keywords:** Fergana Valley, water reservoirs, zooplankton, wheel-like multicellular aquatic organisms (Rotifera), branchiopod crustaceans (Cladocera) and small aquatic crustaceans (Copepoda).

## INTRODUCTION

Fergana Valley is considered the largest 'dug-out' of Tian-Shan Mountain. It is surrounded by Alay and Turkistan in the south, by Qurama and Chatqal in north-west, by Fergana peaks in the north-west. From Fergan basin Alay peak looks like the huge snow chain and the northern lands lying aslant brings up valleys. The Southern eserts almost go down to the Alay Valley. Fergana valley is rich in inner water basins. They serve as the water resource of the surrounding mountain system. Almost all the water flowing down take its beginning from mountain caps and ice. The rainfall does not play that important role. The Syrdarya comes into being by addition of mountain rivers the Narin and the Qoradarya that are to the north-west of Fergana valley [1,2].

Through the mouth of the Syrdarya were built two water reservoirs Qayraqqum and Farkhad, and there were built 16 water reservoirs, which basic serve to irrigate the agricultural system (1-picture).

**Ways of collecting zooplankton organisms.** To study the zooplankton organisms, first, the territory the water basin is situated has been dertermined. . Then it was determined what place most zooplankton organisms come across and the place where to get the samples from. After that, the flow in and point of the water basin and the watching spot has been assigned. In researches, first of all, the water temperature, its clearness, pH and oxygen quantity has been determined [5,7].

From 2009 through 2018, hydro-biological researches were held based on ther materials obtained in different seasons and the diversity of zooplankton organisms were learnt.

## WATER RESERVOIRS SITUATED IN FERGANA VALLEY

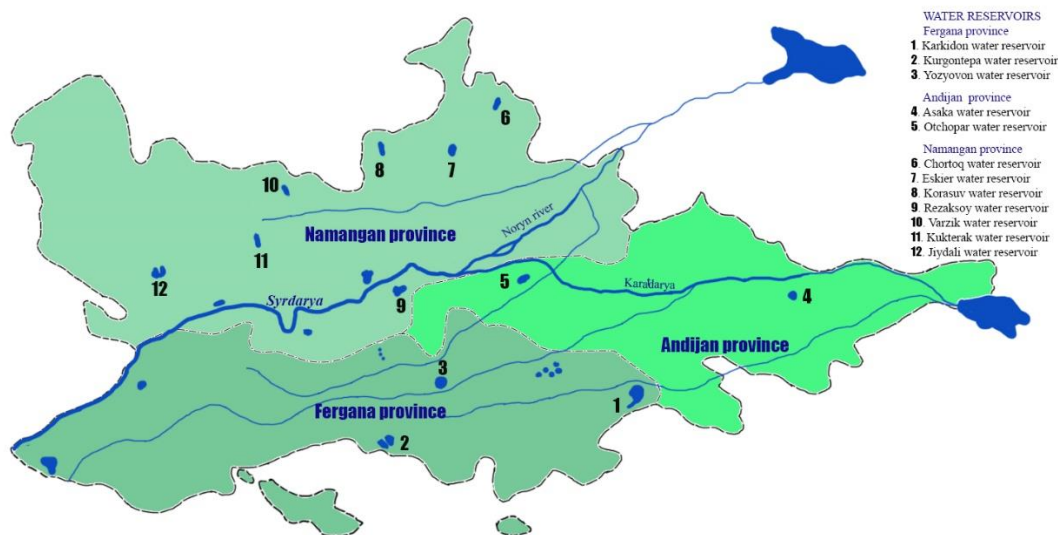


Figure 1. Map scheme of the study area

**Varzik water reservoir.** The samples were gathered from these water reservoirs in spring, summer and autumn. By elaborate examinations it was determined that zooplankton organisms were few-numbered taxonomically. Totally 8 species of zooplankton organisms were determined, 3 of which were Rotiferas, 2 species of Cladoceras and 3 species of Copepodas (1-table).

The relative increase of zooplankton organisms is indigenous to the autumnal season. The species that were encountered in all the seasons were as below: *Asplanchna priodonta*, *Polyarthra longiremis*, *Synchaeta pectinata*, *Daphnia cf. galeata*, *Acanthodiatomus denticornis* and *Cyclops vicinus* excels by loving cold – the first one encountered in spring and autumn, the second in spring. In summer the hot-loving species *Bosmina cf. longirostris* and *Thermocyclops vermifer* were determined. But they were found in the water reservoirs in October months as well.

When the quantitative indication and biomass of zooplanktons were compared according to the seasons, the clear laws of their spreading was observed. From the determined data the maximal quantity of zooplankton organisms goes to summer months and minimal state is proper to spring and autumn.

**Karkidon water reservoir.** During the years when observations help the samples were taken. Although it is mountain area water reservoir, its water is considered warm. That is why the indication of diversity of zooplankton organisms is high enough. Ушбу сув омборида ҳаммаси бўлиб 13 species of zooplankton organisms (4 species of Rotiferas, 4 species of Cladoceras and 5 species of Copepodas) were determined in this water reservoir (table 1).

During the research no other than 6-8 species of zooplankton organisms were found. almost in all the samples *Asplanchna priodonta*, *Daphnia galeata*, *Cyclops vicinus* species were registered. While during the spring months *Keratella cochlearis*, *Moina micrura* were found, *Polyarthra longiremis* and *Synchaeta pectinata* were found mostly in spring and autumn months, and in autumn only *Macrothrix odiosa* and *Eucyclops serrulatus* species were discovered.

*Bosmina longirostris* and *Thermocyclops vermifer* species were encountered during all the researches. Quantitative dynamics according to the seasons were learnt more deeply in Karkidon water reservoir than other water reservoirs. [3, 4].

The quantity and biomass of the zooplankton organisms increased incessantly from March to the summer and then decreased evenly to the month of October. But while the maximum of quantity indicator was proper to June, the maximum of biomass was proper to July and August. The reason for that was the highness of quantitative indicator and biomass quantity of *Daphnia galeata*, *Cyclops vicinus*, *Thermocyclops vermifer*, *Diacyclops bisetosus* and *Paracyclops fimbriatus* in comparison to those of Varzik water reservoir. These water reservoirs are of big importance economically as here one can breed eels, white amur, white and motley fish.

**Qurgantepa and Rezaksoy water reservoirs.** Since these two water reservoirs are similar to each other in terms of its situation, organisms they contain also enjoy likeness and considered to be the species of water reservoirs situated in plains. .... (yillar berilmagan) the samples of zooplankton organisms were gathered and examined. 11 zooplankton organisms were determined among which were 3 Copepodas va 3 Cladoceras , 5 Rotiferas (2-table ). The most developed among they were the species *Thermocyclops vermifer*, *Acanthodiptomus denticornis*, *Daphnia longispina*, *Asplanchnopus sieboldi*, *Brachionus calyciflorus*, *Keratella tropica*. This water reservoirs can stand the chance of breeding eels, white and motley fish, and white amur.

**Rezaksoy water reservoir.** During the researches 10 species of zooplankton organisms were determined. : *Asplanchna priodonta*, *Keratella quadrata*, *Polyarthra* sp., *Synchaeta* sp., *Bosmina* cf. *longirostris*, *Daphnia galeata*, *Daphnia pulicaria*, *Ceriodaphnia turkestanica*, *Acanthodiptomus denticornis*, *Cyclops vicinus* (table 1).

By determining zooplankton organisms with the help of modern detectors it was determined that *Daphnia pulex* was *Daphnia pulicaria*, *Daphnia longispina* was *Daphnia galeata*, *Ceriodaphnia reticulata* was *Ceriodaphnia turkestanica* and at last *Cyclops lacustris* in reality *Cyclops vicinus* [6,8].

In water reservoirs, mainly, the representatives of zooplankton organisms: *Polyarthra*, *Asplanchna*, *Euchlanis*, *Brachionus*, *Keratella*, *Filinia*, *Mesocyclops*, *Daphnia*, *Chydorus*, *Bosmina* are wide-spread. Coastal zones is rich in tropic and subtropic species *Keratella tropica*, *Keratella valga*, *Simocephalus elisabethae*, *Scapholeberis kingi*, *Macrithrix odiosa*, *Alona archeri*.

The rise of water temperature in Fergana valley water reservoirs brings about the increase of zooplankton organism species and spreads misproportionally the water area. The increase in bio-mass of zooplankton organisms in spring is associated with the increase of Cyclopes - *Cyclops kolensis*, *C.vicinus*, *Mesocyclops leuckarti*. In this period Cyclopes pass 5 levels of copepods to dwelling on through predatory. . Spring – summer seasons are the time when there are abundant rotifers.

**Chartaq and Eskier water reservoirs.** The research of hydro-fauna of these water reservoirs have big scientific and practical importance. The ichthyo-fauna compound and fish life activity are genuinely associated with the water reservoir food quantity, compound and its quality. These water reservoirs are alike in situation and formation. In samples taken from both water reservoirs, mainly rotifers, such as *Keratella*, *Asplanchna* va *Hexathra* make most of them. In the components of autumnal zooplankton organism's copepods such as *Cylops vicinus* Uljanin, cladoceran *Bosmina sf* can be found. Rotifera species make the most of the species. Among the most wide-spread descendants *Asplanchna*, *Filina*, *Synchaeta* species can be determined (table).

It was determined that among the Rotiferas belonging to *Keratella* generation *Keratella procurva* (Thope), *Keratella quadrata* (Muller), *Keratella tropica* (Apstein), *Keratella cochlearis tecta* (Goss), *Asplanchnopus multiceps* (Schiran), from *Hexathra* generation *Hexathra fennica* (Levander), *Hexathra oxyuris* (Zernov), from *Filina* generation *Filinia longiseta* Ehrenb, from *Synchaeta* generation *Synchaeta sp* are easily available. From copepods *Cyclops vicinus* Uljanin, from cladocera *Bosmina sp.* are encountered a lot. The development level of zooplankton organism's id due to June and July months. Through the results of researching these water reservoirs it was determined which organism is lived on during the fish evolution. The development of fishing in these water reservoir to develop the white and motley fish, white amur, black amur, carp give the highest effect. Furthermore fishing technology in cage nets adds up.

Table 1. The component of zooplankton organisms in Fergana Valley water reservoirs

№	Species	Water basins			
		I	II	III	IV
<b>ROTIFERA</b>					
1.	<i>Asplanchna priodonta</i>	+	+		+
2.	<i>Asplanchnopus multiceps</i>			+	
3.	<i>Asplanchnopus sieboldi</i>				+
4.	<i>Brachionus calyciflorus</i>				+
5.	<i>Polyarthra longiremis</i>	+	+		+
6.	<i>Keratella procurva</i>			+	
7.	<i>Keratella quadrata</i>			+	+
8.	<i>Keratella tropica</i>			+	
9.	<i>Keratella cochlearis</i>		+	+	
10.	<i>Keratella valga</i> ,				+
11.	<i>Hexathra fennica</i>			+	
12.	<i>Hexathra oxyuris</i>			+	
13.	<i>Synchaeta pectinata</i>	+	+	+	+
14.	<i>Filinia longiseta</i>			+	

CLADOCERA					
15.	<i>Ceriodaphnia turkestanica</i>				+
16.	<i>Bosmina cf. longirostris</i>	+	+	+	+
17.	<i>Daphnia cf. galeata</i>	+	+		+
18.	<i>Daphnia pulicaria</i>				+
19.	<i>Daphnia longispina</i>				+
20.	<i>Simocephalus elisabethae</i>				+
21.	<i>Scapholeberis kingi</i>				+
22.	<i>Moina micrura</i>			+	
23.	<i>Macrothrix odiosa</i>			+	
COPEPODA					
24.	<i>Cyclops vicinus</i>	+	+	+	+
25.	<i>Thermocyclops vermifer</i>	+	+		
26.	<i>Acantodiaptomus denticornis</i>	+			+
27.	<i>Apocyclops denticornis</i>				
28.	<i>Diacyclops bisetosus</i>			+	
29.	<i>Eucyclops serrulatus</i>			+	
30.	<i>Paracyclops fimbriatus</i>			+	

Comment: I – Varzik water reservoir , II – Karkidon, III – Chortoq , IV –Rezaksoy

To conclude, The Fergana Valley can boast of 30 species of zooplankton organisms, such as 14 species of Rotifera, 9 species of Cladocera and 7 species of Copepoda. It was asserted that these water reservoirs look alike each other, can be typical of both with the spread of species of quantitatively and can be considered the type of oligotrophy water basins.

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