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ZOOPLANKTON DYNAMICS OF LAKE KUMSULTAN

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Abstract
Through this article, we have revealed the species composition of zooplankton in Lake Kumsultan and the methods for determining it. Based on this, we can see what the biomass of zooplankton is.

Keywords. Species composition of zooplankton, biomass of zooplankton, coefficient of zooplankton.

Introduction

Zooplankton is fully formed, and its quantity is directly related to the water regime, water temperature, gas regime, and directly to the nutrient supply of water. The water supply regime of Lake Kumsultan has decreased significantly in recent years. Because the water volume of the lake is formed only from wastewater generated from agricultural fields. The water volume does not enter through other routes. [1].

The area covered by water of the lake is 3.8 thousand ha, the maximum depth is 8 meters and the water volume is 27-30 million/m3, currently it has been determined that the area of the lake is 3.2 thousand/ha, the maximum depth is 6.6 meters, and the average depth is 3-5 meters. The water volume is 22-25 million/m3. If you pay attention, the water volume, which has decreased significantly, is decreasing every year.

In 2022, in terms of number and biomass, Cladocera ranked first in the pelagic part of the lake, Copepoda ranked second, and Ratatopia ranked third. The average annual zooplankton abundance is given in Table 1. The number and biomass of zooplankton in spring was 38.4 thousand hundred/m3 with a biomass of 0.53 g/m3, in summer it was 40.5 thousand hundred/m3 with a biomass of 1.7 g/m3, and in autumn it was 32.5 thousand hundred/m3 with a biomass of 1.7 g/m3.

Methods and materials. Zooplankton, like phytoplankton, constitute the main part of the lake's bioresources. The purpose of studying zooplankton is to strengthen its biological potential in the lake, improve the growth and development of fish fry. Zooplankton samples were also collected from the same places where phytoplankton was obtained.

Zooplankton samples consist of 1) quantitative samples and 2) qualitative samples. The Bogorova plankton net was mainly used for collecting quantitative samples. If the water body is shallow, a 1 liter container or a 10 liter bucket can also be used. However, in large lakes, the Jedi type was often used. The entrance of the Jedi type is 18 cm, and its surface is 25 cm. The Jedi type is mainly made of smaller mesh. The Jedi type is universal

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It is mainly used for collecting qualitative and quantitative samples. It is quite convenient. When collecting quantitative samples of zooplankton, it was sent to a certain depth at one point. Just like collecting vertical samples. A separate sample was taken for each meter of depth and placed in a separate container. The Jedi type was worked as follows.For example, the water depth is 3.2 m; 25 cm2x 3.2 meters=0.08lx10=0.8l. If the specified depth is taken as 100, then the resulting number 100: 0.8 l=12.5 is the coefficient for determining the number of zooplankton. The result is the number of any hydrobiont in 1 m3: cyclopssicinus 1500 hundred x12.5 (coeff)=18750 hundred/m3. The number of zooplankton was determined in the same way. When counting zooplankton, a stamp-pipette-0.05 cm3, Bogorov's chamber.Here, too, it is similar to counting phytoplankton. In this case, the sample is filtered and the zooplankton collected in it is collected in a glass. It is collected in a special container. A 0.05 cm3 sample is taken from this container. It is necessary to know how much this will be; 1ml:0.05 cm3=20 ml was poured into the Bogorov chamber and counted.

In the count, representatives of zooplankton belonging to three groups and adults were counted separately. Each age was counted separately. To determine the quality of zooplankton, a preparation is prepared from adults and each member is measured. If there is an 8-fold aperture, if there is an 4-fold aperture, it is 25 µm, if there is an 8-fold aperture and if there is an 2-fold aperture, it is 50 µm, and so on, it is recorded in a special journal.

The systematic sign of Kolovratkih is mastaque, for hornworts their rule is antenna, antennula and 5 pairs of legs for copepods. In this way, zooplankton species are determined. Following all the rules, zooplankton samples were collected and fixed in place with 4% formalin.

According to the ecological characteristics of Lake Kumsultan, it is divided into three parts: the upper part, where water flows in, the middle and the lower part. 3 samples were taken from each part. 3 qualitative samples, 1 for qualitative and 2 for quantitative analysis. From shallow areas, 10 liters of water are filtered with a bucket (with a towel) and a quantitative sample is taken.When determining the quality samples of zooplankton, 33 species were identified, of which 19 are rotifers (Rotataria), 11 are horned ciliates (Cladocera), and 3 are copepods (Capepoda). All species are cosmopolitan and widely distributed. However, some of these species, such as Agctodiaptomus salinus and Mesocyclops crassus, are endemic to the waters of the Caucasus and Central Asia.[2-3]

Among the crustaceans of the Tuban, such as Diaphomosoma brachuurum, Ceriodaphuia rygudi, Mikrofrix spinosa, Microcuclops barsei, etc., are considered representatives of the hydrophilic fauna. The waters from the Sholipoya lands flow into the collector and through the collector also flow into Lake Kumsultan. In general, the zooplankton of Lake Kumsultan consists of a complex of lake and pond plankton organisms, but the lake-specific features are clearly visible.

Like all lakes, zooplankton diversity in Lake Kumsultan is mainly widespread in spring, summer and autumn. It consists of a summer-autumn complex. The dominant species are Arctodiaptomus salinus, Mceriodapmia reticulata, Dohnia loudispina, Diapnanosoma brachyurum, Seridaphnia, reticulate, Daphnia pulex. 68% of zooplankton species occur in spring and summer, while 40.9% occur in autumn.Four of these species are found throughout

the year: Semocephalus vetulus, Ceriodopunia reticulata, Arctodiaptomus, Salinia. Zooplankton begins to be abundant in mid-March. Winter plankton is mainly composed of the rotifers Brachionus usscus, Chidorus sphaericus, and Mesocyclops leuchcarti. Starting in April, zooplankton increases in number as water temperatures rise.[4]

In summer (June-August), the number of species is the same as in spring, consisting of 15 species. Rodentia are represented by 4 species or 26% of the total species: Bradichonus nilsohi, Lecane luna, Notalca acuminata and Asplanchna priodonta, while ciliates are represented by 53%: Dapnuia pulex, Daphinia longispina and Cenioolaphuia reticulata. Copepoda are represented by 20%

So, in the summer, mainly horned barbels dominate. The horizontal distribution of the lake zooplankton is as follows: the main part of the species is located in the pelagic zone. The littoral zone is next in terms of diversity.Thus, the zooplankton of Lake Kumsultan is mainly distributed in the pelagic part, with species mainly distributed from 0.5 meters to 2.0-3.5 meters deep. Due to the rather difficult winter season, development lasted until mid-March. This probably affected the diversity of zooplankton.

The zooplankton of Lake Kumsultan is similar in its diversity and composition to the waters of Southwestern Kyzylkum. However, the difference is that zooplankton does not leave with the water due to the lack of outflow. The common feature of all these lakes is the presence of Difphanosoma brachyurum, Daphnia pulex, Ceridapmid reticalata, Arctodiaptomus salinus.The abundance of Brachvionus hilsonu in summer is an indication of organic pollution of the lake.

Results. Based on the table below, we can see in which season zooplankton in the lake are found.

Zooplankton species composition of Lake Kumsultan Table-1

Species		**Spring**	**Summer**
Rotatoria			
1	*Brachionus ruadridentatus*	+	-
2	*Brachionus usseus (linne)*	+	-
3	*Brachionus calcyciflorus Ahlson*	+	-
4	*Brachionus nilsoni Ahlsron*	-	-
5	*Oeratella quadrata O.F.M*	+	+
6	*O.Vulda (Mull)*	+	+
7	*Notholca acuminate Ehrenberg*	+	-
8	*Testudinella patina Hermann*	+	+
9	*Asplanohna priodonta Gosse*	-	-
10	*Stcane nana Merrai*	+	+
11	*Lecan luna Muller*	+	-
12	*Lecane bulla Gosse*	+	-
13	*Lepadella patella Muller*	+	-
14	*Brachionus angularis Pallas*	-	+
15	*Keratella qudrata (Muller)*	-	+
16	*Keratella cochleares (Gosse)*	-	+
17	*Notholca acuminate Ehren*	-	+

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18	*Filina longiseta (Ehren)*	+	+
19	*Trichocerca longiseta (Sehran)*	+	+
Cladocera			
20	*Diaphanosoma brach sieving*	-	-
21	*Daphnia Longispina O.F.M.*	+	+
22	*Daphnia pulex De Geer*	-	+
23	*Simocephalus vetulus O.F.Mull*	+	+
24	*Moina rectirostris Sending*	-	+
25	*Ceriodaphnia retuculate O.F.M*	+	+
26	*Macrofrix spinosa Norfymanu*	-	+
27	*Chidorus sp.*	+	+
28	*Ceriodaphnia quadrangular Muller*	+	+
29	*Alona guttata Sars*	+	+
30	*Alonella nana (Raird)*	+	+
Copepoda			
31	*Arctodiaptomus Salinus*	+	+
32	*Mesocyclops crassus-Mull*	+	+
33	*Mesocyclops leuckarti Claus*	+	+

Seasonal indicators of zooplankton number (thousands of individuals/m3) and biomass (g/m3) for 2024

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Table-2

Year seasons	**Cladocera**	**Copepoda**	**Rotatoriya**	**Total**
Spring ekz/m3 **g/m3**	10,5 0,2	11,3 0,3	17,1 0,03	38,4 0,53
Summer ekz/m3 **g/m3**	13,8 0,6	18,7 1,1	8,0 0,003	40,5 1,7
Autumn ekz/m3 **g/m3**	11,9 0,5	15,3 1,2	5,3 0,005	32,5 1,7
Total ekz/m3 **g/m3**	36,2 1,3	45,3 2,6	30,4 0,038	111,4 3,9

Conclusion

If you look at the table, crustaceans have a numerical advantage over rotifers. Only in spring do rotifers have a numerical advantage.

Both in terms of number and biomass, copepods dominate. Copepods account for 66% of the total biomass, while hornworts account for 33%. However, in reservoirs, the opposite situation can be observed, with rotifers dominating in terms of number.

Referances

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