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New information on the species composition of zooplankton organisms of Khadicha Lake in Bukhara region

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Abstract. *The article is the first to establish the presence of 36 species of zooplankton organisms in Lake Khadicha, located in the Bukhara region. The names of the identified species are given in the table and their comparative analysis was carried out.*

Keywords: *Uzbekistan, zooplankton, taxonomy, Bukhara, Khadycha, zoological, hydrological, hydrobiological, ecological, ichthyological, experimental laboratory, reservoirs, fauna, flora, Havansky Bridge.*

Introduction

The relevance of the topic The change in ecological stability with the increase in the number of people in the world, the decrease in the biological diversity of water ecosystems requires the preservation of existing species and the rational use of resources. In this regard, it is of scientific and practical importance to assess the modern state of zooplankton organisms in natural and artificial water bodies related to human activities and to determine the prospects for implementation.

In our republic, great attention is paid to the protection of bioresources of water bodies and their rational use in economic sectors. In particular, in order to satisfy the population's demand for fish and fish products, it is necessary to increase the fish feed first. Different types of water bodies indicate the need to determine the biodiversity of zooplankton organisms and use them in fisheries.

The level of study of the problem. The fauna and systematics of zooplankton organisms in a number of reservoirs of the world have been studied by many foreign scientists, including G. Dams (2016); J.M. Boberts (2009); Ch. Farwell (2014); It was studied by M. Povlov (2016).

Alekseeva (1995) researches on systematics of zooplankton organisms, crustaceans and rotifers, their distribution, ecology, hydrology and hydrochemistry of water reservoirs in the CIS countries; N.W. Kartasheva (2006); E.P. Romanova (2009); studied in their works.

A.M. Muhamediev (1967, 1986), I.M. Mirabdullaev (1990, 1992), E.N. Ginatullina (2009), H.X. Abdinazarov (2018), A.R. Kuzmetov (2019), H.M. Done by Toshov (2021). However, the above research works do not provide sufficient information on the fauna of zooplankton organisms of the abandoned lakes in Uzbekistan, their distribution characteristics, ecology, and the use of zooplankton organisms.

The purpose of the study: Bukhara Region Khadichha Lake consists of identification of zooplankton organisms, their reproduction and assessment of their importance in increasing fish productivity through biotechnology.

Zooplanktons, natural food supply in Khadicha Lake and hydrobionts in collectors that bring

water to it are considered as the object of research.

The subject of the study is the leading species of zooplankton in Lake Khadicha, their distribution, dynamics of their qualitative and quantitative development, and their use as food for fish species in the lake.

Research methods. Biological, zoological, hydrological, hydrobiological, ecological, ichthyological, experimental laboratory, statistical and comparative analysis methods were used in the research.

Scientific novelty of the research. For the first time, 36 species of zooplankton organisms were identified and the leading species of zooplankton were identified in Lake Khadicha;

In order to determine the hydrobiological indicators of the factors affecting the fauna and flora of water bodies, it is necessary to find the difference between anthropogenic and natural influences. For this, it is necessary to study all components of water bodies. Zooplankton organisms are one of such components. The work was carried out in Khadicha Lake, Bukhara region, and the composition of zooplankton species was determined in the research work. 14 species of Rotatoria, 14 species of Cladocera, and 8 species of Copepoda. (1 table)

Species composition of zooplankton organisms of Khadicha lake in Bukhara region and some lowland lakes of our republic.

(1 table)

№	Types Lake Devkhana (Bukhara)	Types Lake Devkhana (Bukhara)	Types Lake Devkhana (Bukhara)	Types Lake Devkhana (Bukhara)	Types Lake Devkhana (Bukhara)
	Rotatoria				
1	***Asplanchna sieboldi***	-	+	-	-
2	***Aspanchna priodonta***	+	-	-	+
3	***Bdelloidella gen.sp.***	-	-	+	-
4	***Brachionus angularis***	-	+	+	-
5	***Brachionus calyciflorus***	+	+	-	+
6	***Brachionus nilsoni***	-	-	-	+
7	***Brachionus quadridentus***	+	-	+	+
8	***Brachionus q. Angularis***	-	-	+	-
9	***Brachionus plikatilus***	-	-	+	-
10	***Brachionus p.rotundiformis***	-	-	+	-
11	***Brachionus urseus***	-	-	+	+
12	***C. adriatica***	-	+	-	-
13	***Euchlanis dilatata***	-	+	+	+
14	***Filinia longiseta***	+	+	+	+
15	***Hexarthra oxyuris***	-	-	+	-
16	***Keratella quadrata***	+	+	+	+
17	***Keratella cochlearis***	-	+	-	-
18	***Keratella valga***	-	-	+	-
19	***Keratella tropica***	-	+	-	-
20	***Lophocharis turanicus***	-	+	-	-
21	***Lecane bulla***	-	+	+	-

22	*Lecane decipiens*	-	+	+	-
23	*Lecane closteroserca*	-	-	+	-
24	*Lecane lamelata*	-	-	+	-
25	*Lecane luna*	-	+	+	-
26	*Lecane punctate*	-	-	+	-
27	*Lecane thalera*	-	-	+	-
28	*Lecane quadridentata*	-	+	-	-
29	*Lepadella ehrenbergii*	-	+	-	-
30	*Macrochaetus altamirai*	-	+	-	-
31	*Notolca acuminata*	+	+	+	+
32	*Notolca squamula*	-	-	+	-
33	*Platyias trigla vulgaris*	-	-	+	-
34	*Proales theodora*	+	-	-	-
35	*Proalides sp.*	-	-	+	-
36	*Polyarthra vulgaris*	-	+	-	-
37	*Oeratella quadrata*	-	-	-	+
38	*Oeratella vulda*	-	-	-	+
39	*Synchaeta sp*	-	+	+	-
40	*Synchaeta stulate*	+	-	-	-
41	*Stcane nana Merrai*	-	-	-	+
42	*Testidunelle patina*	+	-	+	+
43	*Testidunelle elliptika*	-	-	+	-
44	*Trichocerca bidensc*	+	-	+	+
45	*Trichocerca longiseta*	-	-	+	-
46	*Trichocerca sp.*	-	-	+	-
47	*Trichocerca valga*	+	-	-	-
48	*Trichotria pocillum*	-	-	+	-
		11	**19**	**30**	**14**
	Cladocera				
49	*Alona rectangular*	+	+	+	+
50	*Bosmina longirostris*	-	+	-	+
51	*Daphnia longispina*	+	-	-	+
52	*Daphnia galeata*	-	+	-	-
53	*Daphnia magna*	+	-	-	+
54	*Daphnia pulex*	+	-	-	+
55	*Diaphanosoma brachiurum*	+	-	-	+
56	*Diaphanosoma mongolianum*	-	-	-	+
57	*Ceriodaphnia quadremgula*	+	-	-	+
58	*Ceriodaphnia turkestanica*	-	+	-	+
59	*Ceriodaphnia retikulata*	+	-	-	+
60	*Chydorus sphaericus*	+	+	+	+
61	*Leydigiya leydigi*	-	-	+	-
62	*Lepodelle ehrenbergii*	-	+	-	-
63	*Macrothrix laticornis*	-	-	+	-
64	*Macrothrix spinosa*	-	-	-	+

65	***Moina brachiate***	**-**	**-**	**+**	**-**
66	***Moina micrura***	**-**	**+**	**-**	**-**
67	***Moina restirostris***	**+**	**-**	**-**	**+**
68	***Oxyurella tenuicaudis***	**-**	**-**	**+**	**-**
69	***Pleuroxus aduncus***	**-**	**+**	**-**	**-**
70	***Simocephalus vetulus***	**+**	**+**	**+**	**+**
71	***Scapholeberis kingi***	**-**	**+**	**-**	**-**
		10	**10**	**7**	**14**
	Copepoda				
72	***Arctodiaptomus salinus***	**+**	**-**	**+**	**+**
73	***Acanthodiaptomus denticornis***	**-**	**+**	**-**	**-**
74	***Acanthocyclops robustus***	**-**	**-**	**+**	**-**
75	***Apocyclops dengizicus***	**-**	**-**	**+**	**-**
76	***Cletocamptus retrogressus***	**-**	**-**	**-**	**-**
77	***Cyclops vicinus***	**+**	**+**	**+**	**+**
78	***Cyclops fursifer***	**-**	**-**	**+**	**-**
79	***Cyclops sp.***	**+**	**-**	**-**	**-**
80	***Diacyclops bicuspidatus odessanus***	**-**	**-**	**+**	**-**
81	***Diacyclops bisetosus***	**-**	**-**	**+**	**-**
82	***Eucyclops serrulatus***	**+**	**-**	**+**	**+**
83	***Halicyclops rotundipes***	**-**	**-**	**+**	**-**
84	***Harpacticoida gen. sp.***	**+**	**-**	**-**	**+**
85	***Leptocaris sp.***	**-**	**-**	**+**	**-**
86	***Megacyclops viridis***	**-**	**+**	**+**	**-**
87	***Microcyclops pachyspina***	**-**	**+**	**-**	**-**
88	***Mesocyclops ogunnus***	**+**	**+**	**+**	**+**
89	***Mesocyclops crassus***	**+**	**-**	**-**	**+**
90	***Mesocyclops leufarti***	**-**	**-**	**-**	**+**
91	***Microcyclops rubellus***	**-**	**-**	**+**	**-**
92	***Onychocamptus mohammed***	**-**	**-**	**+**	**-**
93	***Onychocamptus bengalensis***	**-**	**-**	**+**	**-**
94	***Paracyclops sp.***	**+**	**-**	**-**	**-**
95	***Thermocyclops vermifer***	**-**	**+**	**+**	**+**
96	***Thermocyclops dybowskii***	**-**	**+**	**-**	**-**
97	***Schizopera aralensis***	**-**	**-**	**+**	**-**
98	***Schizopera setulosa***	**-**	**-**	**+**	**-**
	Total	**8**	**7**	**18**	**8**
	Total zooplankton	**29**	**36**	**55**	**36**

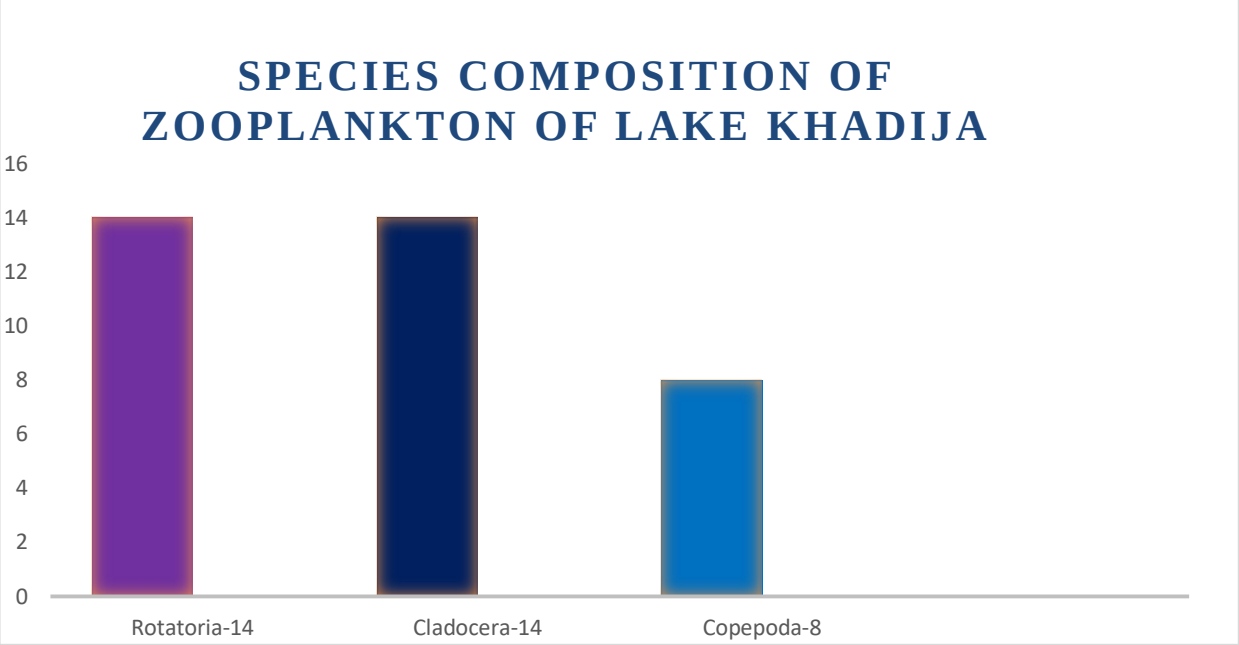
If you pay attention to the table, it is found that 7 types of zooplankton can be found only in Khadicha lake. These are the following types:

1. *Brachionus nilsoni*
2. *Oeratella quadrata*
3. *Oeratella vulda*
4. *Stcane nana Merrai*

5. *Diaphanosoma mongolianum*
6. *Macrothrix spinosa*
7. *Mesocyclops leufarti*

Lake Khadichha is one of the abandoned lakes in the Bukhara region, located in the south-east of the region. This lake is the largest lake in the Qarovulbazar oasis. Lake Khadija is located on the right bank of the Amu-Bukhara Motor Canal (ABMK) near the Havana bridge (Havana most). Khadichha lake was created in the place of ancient valleys (deep depressions) of the Kashkadarya basin. Lake Khadicha is separated from ABMK by a 50-100 m wide road. But the water of ABMK does not fall into Khadicha Lake. A characteristic feature of Lake Khadija is that water does not flow out of it. Since the lake is located in a bog, there is no possibility of water coming out of it.

Taxonomic analysis of zooplankton of Lake Khadija (1 picture)



10 species of zooplankton are the dominant species for Lake Khadija. These are the following:

1. *Brachionus quadridentus*
2. *Daphnia longispina*
3. *Daphnia pulex*
4. *Ceriodaphnia retikulata*
5. *Diaphanosoma brachiurum*
6. *Moina restirostris*
7. *Cyclops vicinus*
8. *Arctodiaptomus salinus*
9. *Mesocyclops crassus*
10. *Arctodiaptomus salinus*

Depending on the season, the number and biomass of zooplankton of Lake Khadycha varies. In the spring, as the water and air temperature rise, the biomass of zooplankton increases significantly. According to our data, zooplankton has a high index in spring. In summer, it decreases. Because the amount of water in Khadicha lake decreases from June. As water decreases, zooplankton gross productivity also increases. Fish, regardless of species, feed on zooplankton in the low embryonic stage of development. Based on the development of zooplankton and phytoplankton, it will be more appropriate to carry out fishing activities in Khadichha Lake in April-May, rather than in autumn (October-November). Because the number of zooplankton decreases in autumn. Most of the hatchlings

die because they cannot eat.

Only fish feeding on local zoobenthos can be found in the lake: zogora, Turkestan mustache, karas, wobla. The main food components of these species are soft algae. So, the bioresources of Lake Khadichha are abundant, but due to the lack of a culture of rational use of them, the lake is becoming more and more eutrophic. Fish productivity is decreasing.

Connect any lake with its future water source. The amount of water is decreasing. Of course, a water limit should also be taken. Fish productivity can be increased by using quota-based fishing and not overfishing.

Nowadays, it is hunted without quota. This is one of the main reasons for the decline of fish.

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