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The Fauna and Ecological Groups of Bivalve Mollusks of Kamashi and Karabakh Reservoirs

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ABSTRACT

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There are 9 species and 1 subspecies in the reservoirs of the Kashkadarya coast in Karabakh and 6 species and 1 subspecies in Kamashi. In the Kamashi reservoir, peloreophiles make up 57%, rheophiles 14% and crenophiles 29%. In the Karabakh reservoir, peloreophiles were found to be 70%, rheophiles 10%, pelolimnophiles 10% and crenophiles 10%.

Introduction

In aquatic ecosystems, bivalve mollusks are a complex group for research. Their morphological features are important in determining their shell shapes, the presence or absence of teeth. At the same time, the distribution of bivalve mollusks and the large number of individuals play an important role in ecosystems in solving practical problems such as zoogeography, history of freshwater fauna, hydrobiology, environmental monitoring, bioindication and other cases.

Analysis of the topic-related literature

Bogatov VV, Starobogatov Ya.I. researched on the identification of territorial diversity, taxonomic structure and signs of variability of

bivalve mollusks in aquatic ecosystems. Bogatov (2014), Andreev *et al.*, (2009) assess the status of populations and the prevalence of global invasive species of these types.

Alyoxina *et al.*, (2007), Panov *et al.*, al. (2009), Son (2009), Yanovich (2013) conducted some research on the importance of biphasic mollusks in determining water pollution levels; Rijnashvili (2009), Sintyurina and Bigaliev (2009), Kuzmenkin (2015) collected data on the distribution, morphology and resources of bivalve mollusks in different water bodies in the country. The shapes and the water bodies in which these types occur are reflected in the researches of ZI Izzatullaev., HT Boymurodov (1992, 2012, 2018, 2019).

Materials and Methods

Scientific materials for this research were collected from the Kamashi and Karabakh reservoirs in 2017-2020. The collected materials were analyzed by the methods of VI Jadin (1938-1952), Starobogatov, ZI Izzatullaev (1984), ZI, Izzatullaev, HT Boymurodov (2009, 2018).

Results and Discussion

Kamashi Reservoir is a hydraulic structure built in Kashkadarya region. It was formed in 1957 by blocking the Shurchasoy natural basin with a soil dam, 4 km from the city of Kamashi. The Karabakh canal, which receives water from the Yakkabog River, flows into the reservoir. As a result of the research, 6 species and 1 subspecies of bivalve mollusks have been found to live in the Kamashi reservoir. They belong to 3 different ecological groups, which belong to peloreophils, renophiles and crenophiles (Table 1). In the reservoir in 2000, 2016, 2018 the species of *Sinanondonta*, *Colletopterum seeds* were distributed from bivalve mollusks with fish acclimatized. *Sinanondonta gibba* is distributed in the waters of the Kamashi Reservoir and its outlet channel, and its density is 0.7. This species is widely adapted to changes in the hydrological regime of the reservoir. The species *Sinanondonta orbicularis* and *S.puerorum* were not found in the reservoir biatops. The reason may be that the variability of the reservoir water regime has shown its effect.

Colletopterum cyreim sogdianum is also common in the Kashkadarya River, from where it passes through canals into the reservoir. In reservoirs, this species was found to have an average of 0.9 per 1m². *Colletopterum ponderosum volgense*, *cocandicum* and *Colletopterum bactrianum* species from the type *Colletopterum* seed species were not found in the reservoir.

Seed species of *Euglesia* and *Kuiperipisidium* are distributed in springs of the upper part of the reservoir. *Kuiperipisidium issykkulense* and *K. polytmeticum* types were found in the waters of springs. Their density was found to be on average 1.1-1.2 per 1m². We encountered many bush shells of *Kuiperipisidium issykkulense* in the Kamashi reservoir. The reservoir regulates river flow by seasons and years, allowing for redistribution of water across areas, along with canals and other drainage structures. This led to the formation of ecological groups in the watersheds with the spread of species of the families *Unionidae*, *Corbiculidae*. *Corbicula sor* is widespread on the right bank of the reservoir and in the canals around it.

Water, which is the habitat of mollusks, with its number of physical properties, has had a different effect on the distribution, density, morphology and ecology of mollusks, which has led to differences in their density of their population. For example, *Corbicula sor* has a density of 1.3 per 1 m². In the Kamashi Reservoir, *C.sor's* shell is heart-yellow in color, the front and back are rounded, and the inner wall is white. We observed that they laid eggs in the spring in the scattered areas of the reservoir. With the advent of spring and the rise in water temperature, we have observed the beginning of the development of reproduction, and it lasts from the second half of March to June. We found that the density of *Corbiculina ferghanensis* and *C. tibetensis* in the reservoir was 2.1-2.2 per 1 m². There are 3 ecological groups of bivalve mollusks in the Kamashi reservoir. There are 4 types of *peloreophiles* in stream waters (*Sinanondonta gibba*, *Corbicula sor*, *Corbiculina ferghanensis*, *C. tibetensis*), reophilus type 1 in stream waters (*Colletopterum cyreim sogdianum*) and crenophiles type 2 (*Kuiperipisidium K.*) in spring and spring watersheds. Among them, *peloreophiles* make up 57%, *rheophiles* 14% and *crenophiles*

29%. 2 species of *Corbiculina ferghanensis*, *C. tibetensis* distributed in the reservoir are the most common *eurybiont species* in terms of density, and the remaining 5 species are *Sinanodontia gibba*, *Corbicula cor*,

Colletopterum cyreim sogdianum, *Kuiperipisidium issykkulense* and *O. rolutimeticum* due to density less than 1.5 per 1m². stenabiont species were identified.

Table.1 Fauna and ecological groups of mollusks of the Karabakh and Kamashi reservoirs (m² / pcs. n = 10)

№	Types	Kamashi	Karabakh	Biotops			Ecological groups
				Stony places	Sandy places	Mud	
1.	<i>Sinanodontia gibba</i>	0,7±0,1	-	-	-	+	Peloreophil
2.	<i>Sinanodontia orbicularis</i>	-	0,7±0,2	-	-	+	Peloreophil
3.	<i>Sinanodontia puerorum</i>	-	0,6±0,1	-	-	+	Peloreophil
4.	<i>Colletopterum bactrianum</i>	-	-	-	-	-	Rheophilus
5.	<i>Colletopterum cyreum sogdianum</i>	0,9±0,2	1,0±0,3	-	+	+	Rheophilus
6.	<i>Colletopterum ponderosum volgensis</i>	-	-	-	-	-	Pelolimnofil
7	<i>Colletopterum kokandicum</i>	-	-	-	-	-	Pelolimnofil
8.	<i>Euglesa hissarica</i>	-	2,1±0,5	-	+	-	Pelolimnofil
9	<i>Euglesa heldreichi</i>	-	-	-	-	-	Pelolimnofil
10	<i>Euglesa turkestanica</i>	-	-	-	-	-	Pelolimnofil
11	<i>Euglesa obliquata</i>	-	-	-	-	-	Pelolimnofil
12	<i>Euglesa turanica</i>	-	-	-	-	-	Pelolimnofil
13	<i>Kuiperipisidium terekense</i>	-	1,8±0,4	-	+	+	Krenofil
14	<i>Kuiperipisidium issykkulense</i>	1,1±0,3	-	-	+	-	Krenofil
15	<i>Kuiperipisidium sogdianum</i>	-	-	-	-	-	Krenofil
16	<i>Kuiperipisidium polytimeticum</i>	1,2±0,2	-	-	+	-	Krenofil
17	<i>Kuiperipisidium behningi</i>	-	-	-	-	-	Krenofil
18	<i>Corbicula cor</i>	1,3±0,5	1,2±0,3	-	+	+	Peloreophil
19	<i>Corbicula fluminalis</i>	-	1,4±0,4	-	+	-	Peloreophil
20	<i>Corbicula purpurea</i>	-	1,7±0,6	-	+	-	Peloreophil
21	<i>Corbiculina tibetensis</i>	2,1±0,7	2,4±0,6	+	+	+	Peloreophil
22	<i>Corbiculina ferghanensis</i>	2,2±0,3	2,8±0,7	+	+	+	Peloreophil
Total species:		7	10	2	10	8	

Karabakh Reservoir is located 15 km from the center of Yakkabog district. It is mainly flooded by the Yakkabog River and two rivers in the Gissar region and replenished by the Kyzylarya River. The Karabakh reservoir

was commissioned in 1977. Thus, as a result of our research, it was determined that 9 species and 1 subspecies of bivalve mollusks live in the bottoms of the Karabakh reservoir, which belong to 4 families and 6

genera (Table 1). With the acclimatization of white grass carp and common catfish, the Chinese toothless mollusk: *Sinanodonta orbicularis*, *S. ruerorum*, came to the Karabakh reservoir by chance. In these fish, the larvae of Chinese toothless (gloxidian) parasitize exist. Today, these mollusks are widespread in all artificial and natural water bodies of Uzbekistan. Sheep breeds occur naturally in the Amudarya and Syrdarya waters. *Sinanodonta* occur in the Karabakh Reservoir. *Ruerorums* are 0.6 pieces per 1m² at depths of 1-2.5 m. The water temperature of the Karabakh reservoir affects not only the growth and reproduction of mollusks, but also plays an important role in their distribution and territorial distribution in the watershed. The *Sinanodonta orbicularis* reservoir averaged 0.7 grains per 1m² distributed in the lateral biats.

The absence of representatives of *Sinanodonta gibba*, *Colletopterum bactrianum*, *Colletopterum ponderosum volgense* and *Solletopterum kokandicum* in the middle part of Kashkadarya in the reservoir proves that it is not directly connected with the river. *Colletopterum cyreum sogdianum* species are widespread on the right and left banks of the reservoir, where their density is very low. However, as in the middle part of Kashkadarya, the Karabakh reservoir also contains sandy biotopes, so only members of the *Corbiculidae* family can be found in such areas. Their density is lower than that of the river, which is explained by the frequent and sharp fluctuations of the reservoir level.

Two-stage mollusks spread in the areas where the river sand dunes sank to the bottom of the reservoir. *Corbicula cor* species are distributed on the right and left banks of the reservoir, and their density is lower than other types of water - 1.2 per 1 m². In addition, *Corbicula fliminalis*, *C. purpurea* occurs in 1.4-1.7 per 1 m² in the reservoir. Both

representatives of the *Corbiculina* genus - *S. tibetensis* and *C. ferghanensis* - are found in the reservoir. Their density is 2.4-2.8. There are 60% of mollusk species in the middle part of Kashkadarya in the Karabakh reservoir, but they differ in species diversity. This difference is directly related to the source of water intake of the Karabakh reservoir. Although the reservoir is located in the Kashkadarya basin, it does not receive water from the river, but the reservoir was formed by the inflow of other mountain rivers. *Euglesa hissarica* and *Kuiperipisidium poplars* are found in 1.8-2.1 per 1 m² area in the part of the reservoir where water is poured into the reservoir by springs. 7 species of peloreophiles live in reservoir muds (*Sinanodonta ruerorum*, *Sinanodonta orbicularis* *Corbicula cor*, *C.purpurea*, *C. fluminalis*, *Corbiculina tibetensis*, *C. ferganensis*), 1 reophilus live in stream waters (*Colletopterum cyreum sogdianum*), 1 species in streams hissarica) and *crenophil 1 species* (*Kuiperipisidium poplar*) live in springs. In the reservoir, peloreophiles make up 70%, rheophiles 10%, pelolimnophiles 10% and crenophiles 10%. We found that 3 species were distributed in the reservoir, *Corbiculina tibetensis*, *C. ferganensis* and *Euglesa hissarica*, are the most common eurybiont species, and 7 species are *stenobiont species* distributed in small biatopes.

In summary, 9 species and 1 subspecies are found in the Kashkadarya coastal reservoirs in Karabakh and 6 species and 1 subspecies in Kamashi. In the Kamashi reservoir, peloreophiles make up 57%, rheophiles 14% and crenophiles 29%. In the Karabakh reservoir, peloreophiles were found to be 70%, rheophiles 10%, pelolimnophiles 10% and crenophiles 10%.

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