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MACROZOOBENTHOS OF RIVERS OF NORTH-WESTERN PART OF GREATER CAUCASUS WITHIN THE BOUNDARIES OF AZERBAIJAN

S. Aliyev

Macrozoobenthos of rivers of north-western part of Greater Caucasus within the boundaries of Azerbaijan. – Aliyev S. – *The article provides information regarding species composition, distribution of macrozoobenthos on biocenosis and its environmental characteristics of north-western rivers of Greater Caucasus in the territory of the Republic of Azerbaijan: Alazani (Ganikh) and its tributaries – Balakenchay, Katekhchay, Ayrichay, Kurmukchay, Kishchay, Karachay, and Talachay rivers. 94 species of macrobenthos organisms belonging to 13 systematic groups were found in these rivers. Among the organisms found, aquatic insects predominate.*
Keywords*: river, macrozoobenthos, benthos, species, biocenosis.*
Address: *23, Academic Zahid Khalilov str., Baku State University, Baku, Azerbaijan; email: alisaleh56@mail.ru*

Макрозообентос річок північно-західного Великого Кавказу в межах Азербайджану. – Алієв С. – *У роботі представлена інформація про склад видів макрозообентосу, розподіл по біоценозах, а також екологічні характеристики макрозообентосу річок північно-західної частини Великого Кавказу на території Азербайджанської Республіки: Алазани (Ганих) та її приток – річок Балакенчай, Катехчай, Айрічай, Кюрмукчай, Кішчай, Карачай і Талачай. У середній і нижній течіях формуються угруповання, які по суті є еврибіонтними, оскільки не надають перевагу тому чи іншому біотопу. Літореофільні, псаммореофільні, фітореофільні та пелореофільні біоценози є відносно стабільними біоценозами річкової екосистеми і періодично відновлюються. У зазначених річках виявлено 94 види організмів макрозообентосу, що відносяться до 13 систематичних груп. Водні комахи домінують у ідентифікованих угрупованнях. Максимальна кількість видів у досліджуваних річкових екосистемах складає 53 види – в Курмукчаї, а мінімальна – в Балакенчаї. В інших річках чисельність представників макрозообентосу коливається від 22 до 51 виду.*
Ключові слова: *річка, макрозообентос, бентос, види, біоценоз.*
Адреса: *вул. Академіка Західа Халілова, 23, Бакинський державний університет, Баку, Азербайджан; email: alisaleh56@mail.ru*

Introduction

The river of Alazani (Ganikh) is the biggest network in the north-western part of Greater Caucasus. It also belongs to Kura River basin, at the same time forming its own basin. The water of Alazani River flows into Mingachevir Reservoir and thereafter colludes with Kura River via this reservoir. The total length of continuous flowing and drying rivers is 1752 km, and the average density of hydrographic network is 0,33 km/km. This is 1,4 times or 30% lower than relevant indicator calculated for the Republic of Azerbaijan.

The natural hydrographic network of mountainous and the part located on the east of north-western part of Greater Caucasus has been developed relatively well. Here, a comprehensive set of physical-geographical factors has had its impact over the development of river network.

Reservoirs, irrigation canals and other hydro-technical junctions and facilities created on the riverbed in recent years to ensure more efficient use of water resources formed in the region, to improve the supply of drinking water to the population and to meet the needs of agricultural areas for irrigation water are of special economic importance.

The hydrographic network is a wide habitat of aquatic organisms with a rich diversity of species, besides having certain impact on the climate, humidity, and temperature of the Alazani network and Ajinohur lowland.

The hydrofauna of the region was first studied in by A.S. Skorikov (Skorikov 1911). He first mentioned *Astacus pulzovi* (Skorikov, 1911) river crustacean. The mollusk and higher crustacean species they found from many rivers and springs of region's territory were new findings to science, and the first descriptions of the species were reflected in the popular and influential magazines of that time. The catalogue developed by O. Rosen in those years provides many macrobenthic animal species that are considered endemic to the region (Rosen 1914).

The hydrobiological research activities in those years were mainly aimed at determining the species composition and geographical distribution of living organisms in aquatic ecosystems.

In the 1970s, the representative of the Institute of Zoology of the Azerbaijan Academy of Sciences A.G. Gasimov conducted studies regarding the hydro fauna in the region (Gasimov 1972). He discovered 34 species of macrobenthic bottom organisms for the rivers of the region. He was able substantiate with scientific evidence the negative impact of fast water flow in the rivers of the region on the development and full formation of bottom fauna.

One of the main trophic links in river ecosystems is the population of macrobenthic species that adapt to different environmental factors, starting from the source up to the mouth, depending mainly on water flow velocity. Observations have demonstrated that the bottom fauna formed in quiet river flows of the region (> 4 m/sec) is much superior to macrozoobenthos in stagnant aquifers due to the richness of the species. The flow velocity is greater in upstream parts of the rivers; mainly stone biocenoses is formed in those parts and characteristic species dominate in the area.

As it is known, the macrobenthic organisms play a significant role in regulation of hydrobiological regime of aquifers (Jadin 1956), and in the food and energy relationships existing between living organisms, the formation of biological productivity of water basins; they form one segment of food chain in ecosystem, certain species are first or secondary interim owners of parasites.

Modern circumstances prefer to assess the level of organic pollution of water by biological methods with the use of bio-indicator species. Hydrobiological studies allow to determine the reproduction biotope and development dynamics of many blood-sucking (parasitical) dipterans (Diptera), which are of medical and veterinary importance. The investigation of bottom fauna expands the understanding of the invertebrate fauna of the region. The aim of the study was to determine the specimen composition of the bottom fauna of Alazani River and its tributaries (Balakenchay, Katekhchay, Ayrichay, Kurmukchay, Kishchay, Shinchay, Karachay and Talachay rivers) and the predominant macrobenthic species in terms of encounter frequency (P > 50%). The research work was carried out using modern methods and tools adopted in hydrobiology.

Material and methods

Samples of the Alazani River and its tributaries were collected from predetermined permanent biological stations. Samples were collected at 3 stations in each river. In case of Alazani River itself, the samples were collected near the Azerbaijani-Georgian border checkpoint, at a station 20 km below the area, and slightly above where the river joins the Mingachevir Reservoir.

Samples from the tributaries of the Alazani River were collected in the upper reaches of the rivers about 500 meters from the confluence of the rivers. Other samples were collected at the biological stations mentioned 10 and 20 km above the 1st station.

Hydromorphology of rivers, water level, water flow rate, biocenoses, vegetation and temperature regime were considered during the collection of materials.

It should be noted that the rivers are close to and far from settlements.

The materials regarding macrozoobenthos were collected from Alazani River and its tributaries in spring and summer periods of 2020 by the general methods recognized by hydrobiology (Jadin 1956). The collected materials from the rivers were transferred to Hydrobiology laboratory of Institute of Zoology of National Academy of Sciences of the Republic of Azerbaijan. Those materials were studied, and the specimen composition were determined based on those samples. Materials were identified up to species composition using different purpose books.

It was established that majority of species discovered in the rivers belong to water insects (Odonata, Ephemeroptera, Coleoptera, Tricho-ptera).

The main water artery of north-western part of Greater Caucasus in the territory of the Republic of Azerbaijan is Alazani (Ganikh) river. Other rivers constitute its left tributaries. Therefore, the focus here will be made on Alazani River as the main water basin of the mentioned region.

Alazani (Ganikh) River originates from Mount Didi Borbalo (2837 m) of the Main Caucasus Range in Georgia. After leaving the Pankisi gorge, the river enters the Kakheti plain, where it receives many branches from the left. In the downstream, at more than 100 km from the right, no tributaries join to the river.

The length of the Alazani/Ganikh river is 413 km, and the area of the basin is 12,080 km^2. 4,755 km^2 of the Alazani/Ganikh river basin belongs to Azerbaijan (equivalent to 5.5% of Azerbaijan's total territory) and 7,325 km^2 to Georgia. The Alazani/Ganikh River flows along

approximately 177 km of the Azerbaijani-Georgian border and more than 200 km of central plain (Mammadov 2006).

The middle and lower reaches of Ganikh river form the state border between the Kakheti region of Georgia and the Balakan, Zagatala, Gakh and Sheki regions of Azerbaijan.

It flows at 90-95 km in the territory of Azerbaijan, and from its left side it is fed by the Balakenchay, Katekhchay, Talachay, Garachay (or Mukhakhchay), Kurmukchay, Kishchay, Shinchay and Ayrichay rivers. The Ganikhchay River flows through a narrow ravine with deep and steep slopes, crossing the low mountain zone surrounding the Ganikh-Haftaran valley in the south, below the confluence of the Ayrichay River. Here the river forms cascades. 4.5 km to its mouth, the Ganikhchay receives its largest tributary, the Gabirri River (Iori). At present, the Gabirri River flows directly into the Mingachevir Reservoir, as the reservoir covers those areas (Fig. 1, Fig. 2).

30% of the annual flow is formed from rain, 40% is groundwater and 30% is snow. The average annual water consumption is 108 cubic meters per second. 50% of the flow passes in spring, 15% in summer, 20% in autumn and 15% in winter. The average annual consumption of suspended solids is 290 kg/s, and sludge is 2636 g/m^3. It is widely used in irrigation along the entire flow of the river.

Geographical coordinates: Starting point: 42°25’18’’N, 45°14’04’’E. The point of junction to Mingachevir reservoir: 41°00’24’’N, 46°38’25’’E.

Fig. 1. Map-scheme of Alazani (Ganikh) River basin

Balakenchay River

Balakenchay is formed at the confluence of the Saatior and Rekhusationi rivers, which flow from the southern slope of the Greater Caucasus.

The river is divided into two tributaries near Balaken district: Little Balakenchay flows into the Katekh River at an altitude of 200 m. The Balakenchay flows at an altitude of 185 m; it joins to Ganikh River at the point 179 km above the mouth (Mammadov 2006).

The average width of Balakenchay is 8.2 km, the average height of the basin is 958 m. The density of the river network is 0.56 km/km^2.

Katekhchay River

Katekhchay begins at an altitude of 2,840 m on the southern slope of Mount Guton (3,659 m) in the Greater Caucasus. The river is called Chamdara until the point where Galaderechay river flows into it.

Katekhchay joins Alazani (Ganikh) river at an altitude of 183 m at the point of 174 km above the mouth. The average width of the river is 11.5 km, and the average height of the basin is 1,038 m. The total river flow is 2657 m, the average slope is 49.2‰. The length of the river is 54 km, the area of the basin is 620 km^2. The density of the river network is 0.53 km/km^2 (Mammadov 2006).

Ayrichay River

Ayrichay is one of the biggest left tributaries of Alazani (Ganikh) River. It is 134 km long and covers an area of 1,810 km^2. The river originates from the southern slope of the Greater Caucasus, 1.5 km west of Teklebashidag (3509 m). It acts as collector and receives the waters of Dashagilchay, Kuntukchay, Kishchay, Shinchay, Duraghachay, and Gashgachay rivers. Ayrichay joins to Ganikh River at an altitude of 135 m, 69 km above the mouth (Mammadov 2006).

The average width of the river is 13.5 km, the average height of the basin is 1168 m. 292 km^2 out of 1810 km^2 basin and 46 km from 134 km length belongs to Dashagilchay river.

Kurmukchay River

Kurmukchay is 55 km long and covers an area of 562 km^2 region. Its length is 55km, and the catchment area consists of 562 km^2. This river starts from the southern slope of Greater Caucasus at the altitude of 2880 m a.s.l. and joins the Alazani River. It is one of the biggest rivers of the network due to its water flow amount. Water resources of the river are used in drinking water supply of residential settlements located in the basin and agriculture needs, in addition to the irrigation.

It begins on the southern slope of the Greater Caucasus - on the border with Dagestan (2880 m). It is formed from the confluence of Kunakhaysu and Hamamchay rivers. The runoff is mainly composed of groundwater (54%), snow (38%) and partly rainwater (18%).

The average annual water consumption of the river is 4.36 cubic meters per second. It exceeds 45-50% of the annual flow in spring and summer, and 10-15% in autumn and winter (Mammadov 2006).

The average width of the basin is 10.2 km, and the average height is 1105 m. The average inclination of the river is 57.2‰. Below the Sheki-Zakatala highway, the river flows into the Ganikh-Haftaran valley and divides into branches.The density of the river network is 60 km/km^2.

Kishchay River

Kishchay was formed by the confluence of mountain streams flowing from the southern slopes of the Seyit-Yurt, Chkhodurmaz, Saylakhan and Kara Kuzen mountains. It was renamed Kishchay after the right tributary of the Kish village flowed into the Duluz River (Mammadov 2006).

The length of the river is 33 km, the area of the basin is 265 km^2. It has four main arms. The average width of the basin is 8.0 km, and the average height is 1184 m. The catchment area is 127 km^2. The total river flow is 2679 m, the average slope is 81.2%. The density of the river network is 0.62 km/km^2.

Shinchay River

Shinchay takes its origin from an altitude of 2,800 m in the south slope of the Greater Caucasus. The river is formed by a series of mountain streams flowing with waterfalls. The river below Shin village is divided into two free tributaries. These arms are also divided into arms along the stream. At the intersection of the Sheki-Zagatala highway, the river divides into 12-15 branches. The length of the Shinchay River is 39 km, the area of the basin is 306 km^2.The average inclination is 66.2‰. 34.4% of the basin is forest (105 km^2). The density of the river network is 0.50 km/km^2 (Mammadov 2006).

Talachay River

Talachay river begins at an altitude of 2,800 m on the southern slope of the Greater Caucasus. The source of the river is many springs in the rocky erosion zone.

Talachay does not reach the Ganikh River and, its end is conditionally considered the point at an altitude of 250 meter near the village Mujig-bina. At high water levels, the water colludes with Mujanlichay river (formed because of rising filtration waters to the surface) and reaches Alazani (Ganikh) river (Mammadov 2006).

Talachay is 40 km long, has an area of 410 km^2 and has 5 main branches. The average width of the river is 10.2 km, the average height of the basin is 868 m. The average inclination of the river is 63.8‰. The density of the river network is 0.49 km/km^2.

Karachay (another name - Mukhakhchay) River

Karachay begins on the southern slope of the Main Caucasus Range (2800 m). Most of the water (50-60%) flows in the spring and summer months, and floods often occur in the river.

The length of Karachay is 56 km, the area of the basin is 572 km^2. It has four main arms. The

average width of Karachay is 10.2 km, the average height of the basin 1112 m. River network has a density of 0.50 km/km^2. Below the mouth of the Sabynchay, the river is separated by 3 branches, which are in constant operation (Mammadov 2006). The far western tributary flows the village of Mukhach in the west and divided into several branches below. This branch of the river is called Mukhakhchay river. The second tributary is the Karachay River, which is the main river, and the third tributary, the Najab-gobu, flows into the Ganikh River 116 km above the mouth (at an altitude of 168 m).

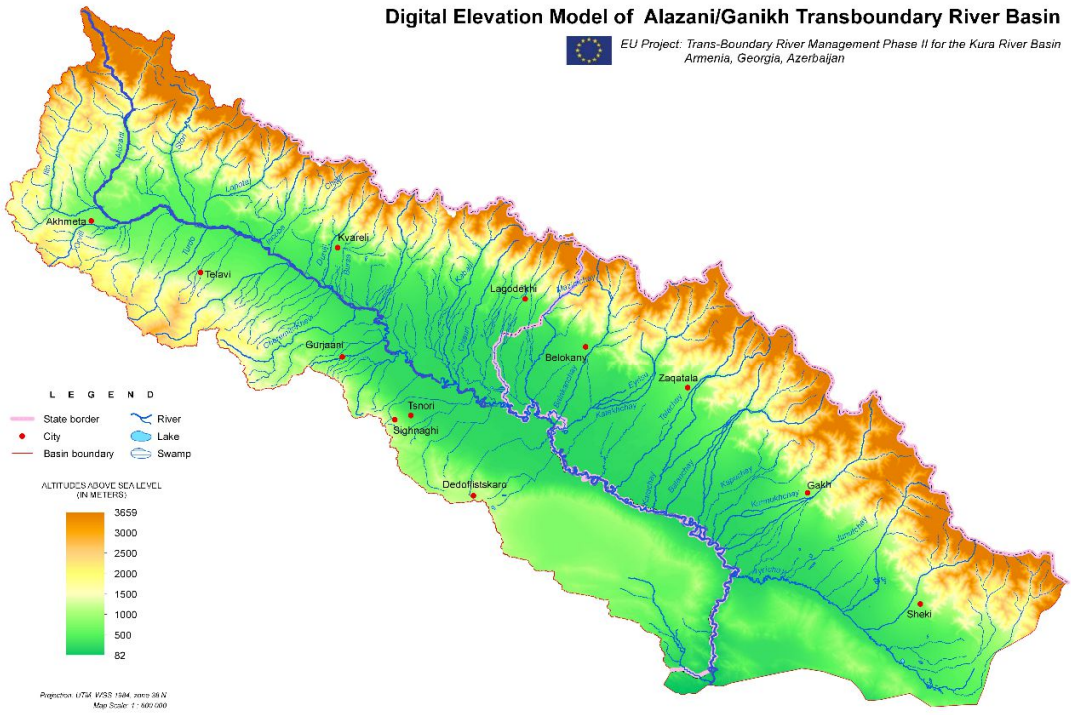

Fig. 2. Digital Elevation Model of Alazani / Ganikh Transboundary River Basin (source: EU Project – Transboundary River Management Phase II for the Kura River Basin)

Results

The results of hydrobiological studies determined that 94 species of benthic organisms are spread in the benthic fauna of the studied rivers. We deemed it appropriate not to provide the species separately for the rivers, but in general list. The materials collected during the study were presented in the form of a table for individual rivers, after determining the species composition. As can be seen from the table, the maximum number of species was in Kurmukchay (53) and Ayrichay (51) and the minimum development was in Katekhchay (22) and Balakenchay (19) (Table 1).

Author would like to note that we did not give the number of species by individual rivers, but we were advised to indicate their number by group.

Oligochaeta: *Nais behningi* (Michaelsen, 1923), *Nais bredscheri* (Michaelsen, 1923), *Tubifex tubifex* (Müller, 1774), *Tubifex sp.*, *Eiseniella tetraedra* (Savigny, 1826).

Hirudinea: *Helobdella staqnalis* (Linnaeus, 1758), *Erpobdella octoculata* (Linnaeus, 1758).

Mollusca: *Sphaerium rivicola* (Lamark, 1818), *Radix auricularia* (*Lymnaea auricularia,* Linnaeus, 1758), *Ampullaceana lagotis* (*Radix lagotis,* Schrank, 1803) *Planorbis planorbis* (Linnaeus, 1758).

Ostracoda: *Candona neglecta* (Sars, 1887), *Ilyocypris divisa* (Klie, 1926), *Ilyocypris bradyi* (G.O.Sars, 1890), *Cyprideis torosa* (Jones, 1850).

Eumalacostraca: *Gammarus lacustris* (Sars, 1863), *Potamon potamios* (Olivier, 1804) Information is provided regarding the specimen composition, distribution by the biocenoses and environmental characteristics.

Ephemeroptera: *Ephemera vulgata* (Linnaeus, 1758), *Acentrella lapponica* (Bengtsson, 1912), *Baetis rodani* (Pictet, 1843), *Centroptilum luteolum* (Müller, 1776), *Cloeon dipterum* (Linnaeus, 1761), *Ecdyonurus fiavimanus* (Klapalek, 1905, *Ecdyonurus venosus* (Fabricius,

1775), *Heptagenia sulfurea* (Müller, 1776), *Caenis macrura* (Stephens, 1835).

Odonata: *Calopteryx virgo* (Linnaeus, 1758), *Epallage fatime* Charpentier, 1840, *Ischnura elegans* (Vander Linden, 1823), *Gomphus vulgatissimus* (Linnaeus, 1758), *Ophiogomphus cecilia* (Fourcroy, 1785), *Ophiogomphus forcipatus* (Linnaeus, 1758), *Libellula depressa* (Linnaeus, 1758), *Somatochlora metallica* (V.d. Linden, 1825).

Plecoptera: *Amphinemura sulcicollis* (Stephens, 1836), *Leuctra fusca* (Linnaeus, 1758), *Perlodes dispar* (Rambur, 1842).

Hemiptera: *Sigara falleni* (Fieber,1848), *Nepa cinerea* (Linnaeus, 1758), *Plea leachi* McGregor et (Kirkaldy, 1899).

Coleoptera: *Brychius elevatus* (Panzer, 1794), *Ilybius fuliginosus* (Fabrcius, 1792), *Platambus maculatus* (Linnaeus, 1758), *Rhantus frontalis* (Marsham, 1802), *Anacaena limbata* (Fabricius, 1792), *Berosus spinosis* (Steven,1808), *Berosus lirudus* (Linnaeus, 1761), *Hydrophilus sp., Hydrobius fuscipes* (Linnaeus, 1758), *Limnius volckmari* (Panzer, 1793).

Trichoptera: *Hydropsyche ornatula* (McLachlan,1884), *Hydropsyche pellucidula* (Curtis, 1834), *Ecnomus tenellus* (Rambur, 1842), *Philopotamus montanus* (Donovan, 1813), *Oxyethira distinctella* (McLach1an, 1880), *Rhyacophila nubila* (Zetterstedt, 1840), *Molanna anguslata* (Curtis, 1834), *Leptocerus tineiformis* (Curtis, 1834), *Lepidostoma hirtum* (Fabricius, 1775), *Micropterna sequas* (McLachan, 1875), *Potamophylax latipennis* (Curtis, 1834), *Potamophylax rotundipennis* (Bauez, 1857), *Cheumatopsyche lepida* (Wallergen, 1891).

Diptera: *Tipula scripta* (Meigen, 1830), *Dicranota sp., Psychoda sp., Pericoma sp.*

Ceratopogonidae: *Culicoides nubeculosus* (Meigen, 1830), *Culicoides longicollis* (Glukhova, 1971), *Leptoconops caucasicus* (Gutsevich, 1951).

Simulidae: *Eusimulium znoikoi* (Rubtsov, 1940), *Simulium kurense schachbusicum* Dzhafarov, 1951, *Odagmia caucasica* (Rubtsov, 1956), *Odaqmia variegata* (Meigen, 1804), *Simulium djafarovi* (Rubtsov, 1962).

Chironomidae: *Ablabesmyia monilis* (Linnaeus, 1758), *Thienemannimyia lentiginosa* (Fries, 1823), *Clinotanypus nervosus* (Meigen, 1818), *Cryptochironomus defectus* (Kieffer, 1913), *Parachironomus pararostrus* (Harnisch, 1923), *Microtendipes tarsalis* (Walker, 1856), *Cricotopus algarum* (Kieffer, 1911), *Cricotopus silvestris* (Fabricius, 1794) *Cricotopus biformis* (Edwards, 1929), *Tanytarsus lobatifrons* (Kieffer,1913), *Eukiefferella oxiana* (Pankratova, 1950), *Eukiefferella sellata* (Pankratova, 1950), *Orthocladius fuscimanus* (Kieffer, 1908), *Orthocladius thienemanni* (Kieffer, 1906), *Orthocladius rivulorum* (Kieffer, 1909), *Diamesa insignipes* (Kieffer, 1908).

Tabanidae: *Tabanus bovinus* (Linnaeus, 1758), *Tabanus autumnalis brunnescens* (Szilady, 1914), *Tabanus lunatus* (Fabricius, 1794).

Table 1. Groups of macrozoobenthos in studies rivers

Rivers		Ayrichay	Alazani	Balakenchay	Katekhchay	Kurmukchay	Kishchay	Garachay	Talachay
Groups									
1	Mollusca	3	-	-	1	2	2	1	1
2	Ostracoda	4	1	-	-	2	-	-	-
3	Eumalacostraca	2	2	2	1	1	-	-	-
4	Ephemeroptera	7	6	4	5	7	7	6	5
5	Odonata	7	7	3	3	8	4	5	4
6	Plecoptera	2	2	2	-	3	-	2	2
7	Hemiptera	5	2	-	2	3	-	1	3
8	Trichoptera	3	4	3	1	6	6	7	5
9	Coleoptera	1	3	-	2	7	5	6	3
10	Diptera	2	2	-	3	4	3	4	3
11	Simulidae	5	4	3	-	3	2	5	2
12	Ceratopogonidae	4	3	2	1	2	1	3	1
13	Chironomidae	6	5	-	3	5	-	-	4
Total		**51**	**41**	**19**	**22**	**53**	**30**	**40**	**33**

Using the Sørensen coefficient (Sørensen 1948) the degree of biocenotic similarity of Kurmukchay with Ayrichay was calculated according to the species composition of

macrozoobenthos and the following results were obtained:

Kurmukchay-Ayrichay: the number of general species – 53; similarity level – 75,5%

The high degree of similarity of the bottom fauna of the rivers running within the territory of Gakh and Zagatala districts in terms of species composition, in other words, the similarity in species diversity should be explained by the similarity of abiotic and biotic conditions for the fauna in these rivers. We analyzed these two rivers because they have higher flow amount, as well as because of their remote location in the area.

In the macrozoobenthos of Kurmukchay river, systematic groups distinguished by the abundance of species diversity are reflected in the diagram below (Fig. 3).

As can be seen, aquatic insects in the bottom fauna of the Kurmukchay (44 species, or 83%) dominate in the distribution.

Cloeon dipterum, Ecdyonurus venosus, Heptagenia sulfurea, Calopteryx virgo, Ischnura elegant, Ophiogomphus cecilia, Somatochlora metallica, Ilybius fuliginosus, Berosus spinosis, Hydropsyche ornatula, Hydropsyche pellucidula, Potamophylax rotundipennis, Eusimulium znoikoi, Odaqmia variegata, Odaqmia caucasica, Simulium kurenseschachbusicum, Ablabes myiamonilis, Clinotanypus newosus, Cricotopus silvestris, Cricotopus biformis, Eukiefferella sellata, Diames ainsignipes and other species that belong to Reophile environmental group predominate because of their detection frequency (P > 50%).

Fig. 3. Distribution of macrobenthos by groups

It has been determined that the specimen composition of macrozoobenthos in Kurmukchay river starting from source towards the mouth is exposed to variations related to changes in riverbed morphology and hydrological characteristics.

Conclusions

The studied rivers start from the Greater Caucasus, flow through the mountainous area, and then pass into the foothills, and in the plains join the Alazani River. The Alazani River also flows into the Mingachevir reservoir. In the upper part of the rivers, the flow rate is high, in the lower part the speed decreases, in the upper part mainly rock biotopes prevail, in the lower part clay and in some places sand sands are also found. In the upper part, mainly floating cancers and springs are found. Representatives of other systematic groups are found in the middle and lower reaches of the rivers. It should be noted that the rivers are narrow in the upper part, the hydromorphology changes gradually in the lower part, the area expands slightly. The lower part of the river has widened due to frequent floods in the area. This is mainly observed in Katekhchay, Kurmukchay, Talachay.

In the middle and lower streams, certain groups are emerged that cannot prefer one or another biotope, according to consequences of sandy, silty, and other areas covered by vegetation, or their mixed forms, which are washed away, displaced as the velocity of water bodies decreases, change to a certain extent with the presence of

organic matter. Lithoreophilic, psammoreophilic, phytoreophilic and peloreophilic biocenoses are relatively stable biocenoses of the river system that are periodically restored.

In 2020, the macrozoobenthos of rivers located on the southern slope of the Greater Caucasus were studied. As a result of the study, 94 species of organisms belonging to 13 systematic groups were identified.

Aquatic insects dominate the identified organisms. The maximum number of species in the studied rivers was 53 species in Kurmukchay, and the minimum number was recorded in Balakenchay. In other rivers, the number of organisms varied between 22-51 species.

GASIMOV, A.G. (1972) *Freshwater fauna of Caucasus*. Elm, Baku. [in Russian].

JADIN, V.I. (1956) *Methods for studying the bottom fauna of water bodies and the ecology of bottom invertebrates and the life of fresh waters in the USSR*. Publishing House of the Academy of Sciences of the USSR, Moscow-Leningrad, pp. 279-320. [in Russian].

MAMMADOV, M.A. (2006) Hydrography of Azerbaijan. Nafta-Press, Baku. [in Russian].

ROSEN, O. von. (1914) Kataloq der schalentragenden Mollusken des Kaukasus. *Mitteilungen des kaukasischen Museums*: 48-62.

SKORIKOV, A.S. (1911) A new species of crayfish from the Caucasus. *Publishing house of the Caucasian Museum*, 5: 26-32.

SØRENSEN, T.A. (1948) A new method of establishing groups of equal amplitude in plant sociology based of similarity of a species content and its applications to analysis of the vegetation on Danish commons. *Kongelige Danske Videnskabernes Selskab*. 5(4): 1–34.