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MODERN SITUATION OF *Hirudo orientalis* IN LANKARAN NATURAL PROVINCE WATER BASINS

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СОВРЕМЕННОЕ СОСТОЯНИЕ *Hirudo orientalis* В ВОДОЕМАХ ЛЕНКОРАНСКОЙ ПРИРОДНОЙ ОБЛАСТИ

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Abstract. The Eastern medical leech (*Hirudo orientalis* Utevsky et Trontelj, 2005) belongs to the Hirudinea class to a Euhirudinea subclass to the Gnathobdellidae order, *Hirudo* genus. *H. orientalis* is ectoparasitic bloodsucking. Medicinal leeches feed by sucking blood of the vertebrates such as mammals, fish, amphibians, birds and reptiles. They live in the freshwater basins in swamps, rivers and lakes. Materials were collected through the suture-catching nets to breed leeches and carry out investigations in laboratory conditions. The study was carried out in 2018-2020 in the 42 water bodies of the Lankaran natural province. *H. orientalis* was found in only 16 of them. The weight of the collected leeches was 1.0-2.5 g, and the length was between 4-10 cm.

Аннотация. Восточная медицинская пиявка (*Hirudo orientalis* Utevsky et Trontelj, 2005) относится к классу Hirudinea, подклассу Euhirudinea, семейству Gnathobdellidae, рода *Hirudo*. *H. orientalis* — эктопаразитарный кровосос. Питаются, высасывая кровь позвоночных животных, таких как рыбы, земноводные, рептилии, птицы и млекопитающие. Они обитают в пресноводных водоемах: на болотах, в реках и озерах. Материалы собирали с помощью шовных сетей для разведения пиявок и проведения с ними исследований в лабораторных условиях. Сбор материала проводился в 2018–2020 годах. Из 42 водоемов Ленкоранской природной области *H. orientalis* был обнаружен только в 16 из них. Масса собранных пиявок варьировала в пределах 1,0–2,5 г, а длина — 4–10 см.

Keywords: *Hirudo orientalis*, laboratory experimentation, hirudotherapy.

Ключевые слова: восточная медицинская пиявка, лабораторные опыты, гирудотерапия.

Only one representative of the *Hirudo* genus, the Eastern medical leech (*Hirudo orientalis* Utevsky et Trontelj, 2005), has been recorded in Azerbaijan. *H. orientalis* is considered superior to other leeches due to its specific characteristics (aggressiveness and quality of biologically active substances) [1, p 61-66]. This species is spread not only in Azerbaijan, but also in Kazakhstan, Uzbekistan and Iran. Eastern medicinal leech has been used commercially for many years and was included in the I and III editions of the Red Book of Azerbaijan (1984 and 2023).

The geographical location of Azerbaijan creates fertile conditions for aquatic invertebrates, including *Hirudo orientalis*. *H. orientalis* is widely used in hirudotherapy, folk medicine and cosmetology. In other countries, in addition to these, the use of medical leech can be observed in

surgery. The main goal of our research work was to determine the degree of spread of *H. orientalis* species in freshwater basins of Lankaran-Astara Economic Region. Lankaran natural province, which is located in the southeast of the republic and covers 7.1%, is one of the areas where *H. orientalis* is widespread. Jalilabad, Masalli, Yardimli, Astara, Lankaran and Lerik districts are included in its composition, the total area of which is close to 6000 km². The territory is mainly mountainous, and the eastern and northeastern parts are lowlands. The province, which differs from other regions of Azerbaijan due to its nature, is considered a humid subtropical region. Vilashchay and Bulgarchayi rivers with a length of more than 100 km can be given as an example. The average annual air temperature in the foothills is 14.1-14.3°C. The average monthly temperature in the hottest months (July, August) is 24.3-26°C, and in the coldest months (January) the average temperature varies between 2.2-3.9°C. The water temperature was 14-27°C [2, 3].

Materials and methods

In accordance with the purpose of the research, in 2018-2020:

Bolgarchay (N38°45'33" E48°23'43"),
Pirsaatchay (N40°40'31" E48°35'13"),
Sarisu lake (N40°02'50" E48°10'22") of Bilasuvar district,
Bahramtepe reservoir (N 39°44'37" E 47°55'01"),
Kazimabad (N39°8'12" E48°36'27"),
Kazimabad-1 (N39°7'37" E48°37'50"),
Uzuntepe (N39°12'27" E48°31'34"),
Goytepe (N39°7'32" E48°37'47")
Misharchay (N38°58'48" E48°34'8"),
Mollaoba lake of Masalli district (N38°56'16" E48°41'46"),
Vilashchay (N38°57'54" E48°33'32"),
Alvadi (N39°4'44" E48°37'33"),
Luren (N38°59'22" E48°33'32"),
Tatyan (N39°4'44" E48°37'33"),
Mahmudchala (N39°43'84" E 48°73'81"),
Korchay (N38°56'83" E48°46'09"),
Bababulagi (N38°88'03" E48°70'09"),
Babaser village ponds (N 38°94'32" E48°68'45"),
Istisu (N38°97'31" E48°55'43"),
Boradigah river (N38°47'52" E48°50'31"),
Balavilash river (N38°46'53" E48°50'33"),
Takhtachay (N38°57'54" E48°45'9"),
Takdam waterfall (N38°94'82" E48°47'84"),
Lankaran region Khanbulan Lake (N38°44'27" E48°49'58"),
Boladi River (N38°47'51" E48°48'31"),
Kizylagac Bay (N39°04'59" E49°01'45"),
Lankaranchay (38°36'21"N 48°45'65"E),
Lekar River (N38°46'57" E48°44'54"),
Girdani River (N38°46'59" E48°47'30"),
Virural River (N38°46'55" E48°48'59"),
Sinovlu River (N38°47'51" E48°48'31")
Kargelan River (N38°76'97" E48°80'34"),

Kondalan River (N39°53'76" E47°58'56"),
Vasharuchay (N38°42'31" E48°45'50"),
Lekar river of Lerik district (N38°46'8" E48°46'43"),
Lerik waterfall (N38°79'49" E48°48'14"),
Lankaranchay (N38°42'59" E48°45'13"),
Almu village waterfall (N38°45'02" E48°32'64"),
Bibiyani waterfall (N38°74'64" E48°59'44"),
Yardimli district, Vilashchay, Korchay and Yardimli waterfall (N38°56'62" E48°26'88") were studied.

Generally accepted hydrobiological methods were used for the collection of materials [5].

In order to catch the leech, the shock method and fresh liver were used. During hunting, 5 strong blows are made with a 1 m stick with a difference of 2 seconds. Then, within 3 minutes, leeches are collected. This process is repeated several times within 10 minutes. After hunting, the leech is counted and released into the water body [4].

Part of the collected materials was fixed in 95% alcohol to study the morphology (size of the body and gills, structure of the cuticle) and molecular-genetic diversity of the species.

Results and their discussion

In modern times, the interest in medicinal leech (*H. orientalis*) has created a basis for conducting detailed research in Azerbaijan. Medical leech is widely used in both medical and cosmetological fields in a number of developed countries. For this reason, there is a need to conduct research on studying the properties of the medicinal leech, determining its current status in our water bodies, and investigating methods of reproduction in natural and laboratory conditions.

In Lankaran natural province, 42 water bodies were studied, and *H. orientalis* was found in only 16 of them. The weight of the collected leeches was 1.0-2.5 g, and the size was between 4-10 cm. Areas where medical leeches are found are mostly freshwater bodies. Algae, water insects, frog, swamp turtle, water insects and various fishes were also found in the fauna of the studied water bodies.

Lankaran natural province is located in the humid subtropical zone and has a dense river network. The rivers are fed by rain and groundwater and flow directly into the Caspian Sea. Samples were collected from ponds, reservoirs, and rivers. Brief characteristics of some studied water bodies:

Lake Khanbulan is located in Lankaran district, its area is 24.6 km². Human river flows into this water basin. The water temperature is 3.5°C in winter and 25°C in summer (Figure 1).

Lankaranchay is considered the main river of Lankaran natural province. The total area of the river basin is 1080 km. Its water is chloride-sodium, its mineralization is 0.2-0.5‰. The water of the river is used for irrigation works, including the water supply of Lankaran city. It passes through the territory of Lerik and Lankaran districts and flows into the Caspian Sea. Rainwater forms the main part of the flow (Figure 2).

Beshari river — its length is 38 km, and its total area is 171 km². 72% of its annual flow is rain, 23% underground and 5% snow water (Figure 3).

Mahmudchala is located 22 meters below sea level. The total area is 8000 ha. The total area of the Mahmudchala wetland system is 23,000 ha. The climate around the lake is dry subtropical (Figure 4) [6].



Figure 1. Khanbulan Lake



Figure 2. Lankaranchay



Figure 3. Basharu river



Figure 4. Mahmudchala

Thus, as a result of our research in water bodies in Jalilabad, Masalli, Yardimli, Astara, Lankaran, and Lerik districts, *H. orientalis* was found in 16 water bodies. 40 in Kazimabad, 25 in Kazimabad 1, 45 in Uzuntepe, 15 in Goytepe, 10 in Misharchay, 56 in Mollaoba lake, 17 in Vilashchay, 15 in Alvadi, 5 in Lurand, 34 in Tatyán river, 51 in ponds located in Babaser village, 5 in Khanbulan lake, 31 in Boladi river, Ghizil-agaj 103 individuals were recorded in the bay, 3 in the Lekar river, and 2 in the Lerik waterfall (Figure 5).

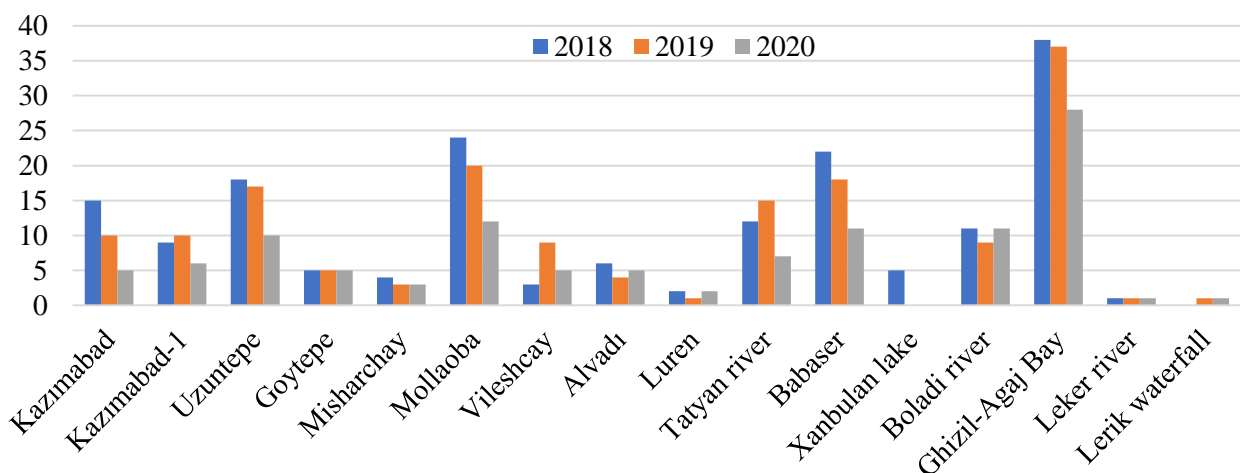


Figure 5. The percentage of leeches in the water bodies where the *H. orientalis* species is found in the Lankaran natural province by year

In total, 500 specimens were recorded in the Lankaran natural province, and 30 specimens were brought to the laboratory for research. Bilasuvar and Salyan districts Bolgarchay, Pirsaahtchay, Sarisi lake, Bahramtepe reservoir, Masalli district Mahmudchala, Korchay, Bababulagi, Istisu, Boradigah river, Balavilash river, Tekdam waterfall, Lankaranchay, Lekar river, Girdeňi Virural river, Sinovlu river, Kargelan river of Lankaran district, Kondalan river, Vasharuchay, Lankaranchay of Lerik district, Almu village waterfall, Bibiyani waterfall, Vilashchay, Korchay and Yardimli waterfall of Yardimli district, *H. orientalis* was not detected.

Table

TEMPERATURE REGIME OF THE STUDIED WATER BODIES (°C)

Observation	2018			2019			2020
	May	July	September	May	August	September	September
Kazimabad	26	32	29	25	33	28	26
Kazimabad-1	27	30	28	27	31	26	24
Uzuntepe	27	29	29	25	30	26	21
Goytepe	26	31	29	25	30	27	22
Misharchay	27	33	30	27	32	30	28
Mollaoba Lake	29	31	27	26	30	24	23
Vilashchay	26	31	25	25	30	23	24
Hear River	29	30	28	27	31	26	28
Luren	27	30	28	28	30	28	26
Tatyan River	29	29	29	25	32	27	28
Babaser village-ponds	30	34	30	30	33	29	29
Khanbulan Lake	30	33	31	30	32	29	27
Boladi River	28	30	28	29	30	29	28
Kizilagac Bay	29	31	29	29	32	30	29
Lekar River	26	28	29	28	29	28	28
Lerik Waterfall	25	29	27	29	30	29	29

Table shows the water temperature regime (C°) in the water bodies where *H. orientalis* was found during the years of our research.

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