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HELMINTH OF COMMON SNAKE (*NATRIX NATRIX L.*) OF MORDOVIA

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Summary

In 2008 it is investigated helminthofauna of the grass snake Natrix natrix L. in territory of the Republic of Mordovia (Russia). 15 species of parasitic worms (from which 11 species concern to class Trematoda and 4 - to class Nematoda) are marked at a reptile. From adult stages the greatest extensiveness of an invasion Macrodera longicollis, Astiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula (Trematoda) and Rhabdias fuscovenosus (Nematoda) differed. Among larval forms high extensiveness of an invasion was characteristic for larval stages Pharyngostomum cordatum and Alaria alata (Trematoda).The specific structure of helminths of grass snake from Republic of Mordovia is similar with parasite fauna of the snake from other regions of the Middle Volga region

Key words: *helminthofauna, grass snake Natrix natrix L., Trematoda, Nematoda, Macrodera longicollis, Astiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula, Rhabdias fuscovenosus, Pharyngostomum cordatum, Alaria alata*

Introduction. Along with gradual studying parasitofauna of amphibious in the Republics of Mordovia, still not I was are studied in the parasitological relation other not less interesting group – reptiles.

The fi rst data on fauna of helminths are provided in this message common snake *Natrix natrix Linnaeus*, 1758 from the territory of Mordovia. This species of reptiles – the most mass and evribiont in the region. It has a wide area, occupies various in character station, preferring to keep the hu-midifi ed places, lives and in an anthropogenous landscape, in the territory of agri-cultural grounds, settlements where can do without reservoirs [1-3].

Materials and methods. Material for research was collected in May – July, 2008 in two habitats in the territory of the Republic of Mordovia: 1) The Temnikov area, the item district Pushta (near the forest settlement), 2)the Zubovo -Polyansk area, Tenishevo surrounding former village (the river bank in forest area). In total it is investigated by 31 copies natrix. Researches of parasites of reptiles it was carried out by a technique of full parasitological opening [4].

Collecting, fixing and cameral processing of a material were carried out by the traditional, standard methods in a domestic helminthology [5-8]. At distribution of types of helminthes on systematic taxon authors considered the last data on systematization of trematoda [9].

Data on biology and distribution of helminthes are obtained in K.I.Skrybin's multivolume report «Trematoda of animals and the person» [10], works of V.P. Sharpilo [11, 12], A.A. Kirillov [13].

Results and discussion. In total the common snake in Mordovia has 15 species of helminthes (2 species from them aren't identified), relating to the following systematic groups: Trematoda – 11 species (7 - at an adult stage, 4 – on larval), Nematoda – 4 (2 at an adult stage, 2 – on larval).

Phylum Plathelminthes Class Trematoda Rudolphi, 1808 Family *Plagiorchiidae Luhe*, 1901.

Opisthioglyphe ranae (Frolich, 1791) Looss, 1899 Localization: intestines.

In Russia it is recorded in the territory of the Volga - Kamsk reserve, the Samara Region and the delta of Volga.

Accident it is occurred at common snake and vipers [14-15].

Intermediate hosts are mollusks of the species *Limnaea, Galba, Radix*, addi-tional host is larvae of mosquitoes, a caddis fly.

Metacercaria can be met at amphibious and their larvae.

Final host is amphibian.

Family *Leptophallidae Dayal*, 1938 Taxonomical reference: V.V.Tkach with coauthors [16-18] allocate the genes *Leptophallus Lühe*, 1909, *Paralepoderma Dollfus*, 1950, *Macrodera Lühe*, 1899 and *Metaleptophallus Yamaguti*, 1958 in separate family *Leptophallidae Dayal*, 1938. We share this point of view.

Leptophallus nigrovenosus (Bellingham, 1844) Lühe, 1909 Localization: gullet, top department of a stomach.

Typical parasite of common snake.

In the territory of Russia it is found in the Voronezh, Kaliningrad and Samara region [14-15]. Outside the country it is recorded in Ukraine, Azerbaijan, Georgia, Great Britain, Bulgaria, Hungary, Germany, Egypt, Italy, Poland, Tunisia, France, the Czech Republic, Slovakia.

Intermediate hosts - mollusks of Limnaea stagnalis, Radix ampla, R. peregra and amphibian (moor, grassy, edible frogs, a bombina, a toad ordinary, a triton edge) and their tadpoles.

Widely specific parasite of common snake and vipers

Macrodera longicollis (Abildgaard, 1788) Lühe, 1899 Localization: air bag of a lung.

Tightly specific parasite of common snake. It is one of the most ordinary and widespread parasites of Natrix. In Russia it is recorded in the Astrakhan, Vol-gograd, Voronezh, Samara region, the delta of Volga, the Krasnodar and Stavropol edges, Kalmykia [14-15]. It is abroad registered in the territory of Ukraine, Belarus, Azerbaijan, Georgia, Kazakhstan, Uzbekistan, Austria, Great Britain, Bulgaria, Hungary, Germany, Denmark, Iran, Spain, Italy, Poland, Turkey, France, the Czech Republic, Slovakia.

Intermediate hosts - *Planorbis planorbis* mollusk, additional - lake and grassy frogs.

Paralepoderma cloacicola (Lühe, 1909) Dollfus, 1950 Localization: rectum.

One of the most ordinary and widespread parasites of Natrix and some populations of vipers. In the territory of Russia it is found in the Volgograd, Voronezh, Orenburg, Rostov and Samara Region, the delta of Volga, the Volga - Kamsk reserve (Kirillov, 2011; Kirillov, etc., 2012). It is abroad recorded in Ukraine, Belarus, Azerbaijan, Georgia, Kazakhstan, Hungary, Germany, Italy, Morocco, Poland, Romania, France, the Czech Republic, Slovakia.

Intermediate hosts are Planorbis planorbis mollusk. Broad specificity parasite of amphibious families Salamandridae, Discoglossidae, Pelobatidae and Ranidae. Repeatedly is met in helminthfauna of grassy, moor and pond frogs, a spadefoot toad within Mordovia [19-21].

Widely specific parasite of common snake and vipers Family *Telorchiidae Looss*, 1899

Telorchis assula (Dujardin, 1845) Dollfus, 1957.

Localization: intestines.

One of the most ordinary and widespread parasites of Natrix, meeting practically within all area of hosts. In Russia it is found in the delta of Volga, the Volga - Kamsk reserve, the Volgograd, Voronezh, Kaliningrad, Moscow, Rostov, Samara, Saratov Region, Kalmykia, Karelia, Dagestan [14-15].

It is abroad registered in the territory of Ukraine, Belarus, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, Great Britain, Bulgaria, Hungary, Germany, Italy, Poland, Romania, France, Slovakia, the Czech Republic.

Intermediate hosts are tadpoles of lake and grassy frogs.

Tightly specific parasite of common snakes. Family *Pleurogenidae Looss*, 1899

Pleurogenes claviger (Rudolphi, 1819) Looss, 1896 Localization: intestines.

Casual parasite of ordinary Natrix.

In the territory of Russia it is noted in the Samara Region [14]. Abroad – Ukraine. Intermediate hosts are mollusks of genus Planorbis. Obligate final hosts are amphibians (lake, moor frogs, a green toad) [22]. Common natrix is facultative hosts [15, 22].

Family *Strigeidae Railliet*, 1919.

Strigea strigis (Schrank, 1788) Abildgaard, 1790, larvae.

Localization: mesentery, fatty tissue, body cavity. At this stage of development ordinary and widespread parasite of snakes of Russia. At other reptiles the metacercariae is met seldom.

In the territory of Russia it is recorded in the Astrakhan, Volgograd, Leningrad, Samara and Saratov Region, the delta of Volga, the Volga- Kamsk reserve, Kalmykia, Khabarovsk territory [14-15]. Outside Russia it is found in Ukraine, Belarus, Georgia, Uzbekistan, Germany, Poland.

Final hosts – day birds of prey and owls.

Strigea sphaerula (Rudolphi, 1803), Szidat, 1928, larvae Localization: mesentery, fatty tissue.

As well as *S. strigis Strigea sphaerula* at a metacercariae stage is an ordinary parasite of snakes (especially natrix). In Russia it is found in the delta of Volga, the Volgograd and Samara Region [14-15]. It is abroad found in Ukraine, Belarus, Poland, the Czech Republic, Slovakia.

Final hosts are corvidae birds (the gray crow, Common Magpie). Family Alariidae Hall et Wigdor, 1918. Alaria alata (Goeze, 1782), Krause, 1914, larvae Localization: fatty tissue, body cavity.

One of the most widespread and numerous parasites of snakes. In Russia it is recorded in the delta of Volga, the Volga-Kamsk reserve, Vologda, Voronezh, Ryazan, Samara and the Tver region, Dagestan, Kalmykia, the lake of Kunashir [15]. It is noted also in the territory of Ukraine, Belarus, Azerbaijan, Georgia, Armenia, Uzbekistan, in Hungary, Germany, Poland, Romania, France, Czechoslova-kia.

Final hosts are representatives of dog families (a fox, raccoonlike and domestic dogs, etc.) and marten (the American mink). Various batrahophage – reptiles and mikromammaliya act as the reservoir host of the Ist order [11, 23, 24].

Pharyngostomum cordatum (Diesing, 1850) Ciurea, 1922, larvae Localization: fatty tissue, serous covers of an internal.

At a metacercariae stage it is ordinary and widespread parasite of snakes of fauna of Russia. It is found in the delta of Volga, the Volgograd and Samara Region [14-15], is marked out in Belarus, Ukraine, Kazakhstan, Germany, Romania, India, Burma, Vietnam, the People's Republic of China, Japan. Final hosts - predatory mammals of cat's and dog families. Common natrix is reservoir hosts of a parasite [8, 11, 25].

Genera insertae sedis Taxonomical reference: Traditionally all researchers included Astiotrema Looss, 1900 to Plagiorchis.

S. Prudkho and R.A.Brey [26] stated opinion that Astiotrema represents a combined genus. V.V.Tkach researches with coauthors [18], P. D. Olson with coauthors [27] showed that Astiotrema monticelli Stossich, 1904 wasn't related to Plagiorchis. Recent researches of parasites of the Astiotrema species - A. monticelli, A. reniferum (Looss, 1898) and A. turneri Bray, van Oosterhout, Blais et Cable, 2006 found their communication with heterophyes while A. trituri Grabda, 1959, on the contrary, is close to Plagiorchis. For A. trituri V.V.Tkach offered the new genus *Neoastiotrema Tkach*, 2008 [9].

Now the genus *Astiotrema Looss*, 1900 belongs to taxon with not clear systematic situation [9].

Astiotrema monticelli Stossich, 1904.

Localization: intestines Typical parasite of Common natrix.

In Russia it is noted in the Voronezh, Volgograd, Rostov and Samara Region, the delta of Volga, the Volga-Kamsk reserve [14-15]. It is abroad found in Ukraine, Hungary, Italy, Romania, and France.

Intermediate hosts are Codiella (Bithynia) leachi mollusk, tadpoles and adult individuals of a spadefoot, an moor and lake frog [28]. Tightly specific parasite of snakes. Viper snakes are marked out by as casual hosts.

Phylum Nemathelminthes Class *Nematoda Rudolphi,* 1808 Family *Rhabdiasidae Railliet*, 1915

Rhabdias fuscovenosus (Railliet, 1899). Localization: lung.

Is one of the most ordinary and widespread parasites of the natrix [29].

In our country, it is noted in the Astrakhan, Volgograd, Voronezh, Kaliningrad, Rostov, Samara and Saratov Region, Dagestan,

Kalmykia. Abroad - in Ukraine, Belarus, Georgia, Kazakhstan, Uzbekistan, Great Britain, Hungary, Italy, Canada, Poland, Romania, the USA, France, the Czech Republic, Slovakia.

Tightly specific parasite of the natrix. In other species of snakes it is found by accident.

Family *Strongyloididae Chitwoodet* McIntosh, 1934.

Table 1. Helminthes of *Natrix natrix* in Mordovia

Parasite	Pushta			Tenishevo		
	EI, %	II, exemplar	IAP, exemplar	EI, %	II, exemplar	IAP,exemplar
Trematoda						
Opisthioglyphe ranae	6,3±6,2	5	0,3±0,3	-	-	-
Astiotrema monticelli	75,0±11,2	1-29	9,1±2,4	100	3-39	15,3±3,4
Leptophallus nigrovenosus	62,5±12,5	1-12	3,4±1,0	100	2-39	15,6±3,4
Macrodera longicollis	93,8±6,2	1-9	3,2±0,7	85,7±9,7	1-24	5,4±2,2
Paralepoderma cloacicola	6,3±6,2	12	0,8±0,8	57,1±13,7	8-19	7,6±2,0
Telorchis assula	50,0±12,9	2-54	12,3±4,8	100	8-124	52,3±12,6
Pleurogenes claviger	-	-	-	28,6±12,5	4-8	1,7±0,8
Strigea strigis, larvae	62,5±12,5	1-32	6,5±2,4	57,1±13,7	1-5	1,3±0,5
S. sphaerula, larvae	31,3±11,9	1-22	1,8±1,4	-	-	-
Alaria alata, larvae	87,5±8,5	3-455	65,0±28,1	100	10-121	45,7±11,4
Pharyngostomum cordatum, larvae	87,5±8,5	3-1850	480,6±136,8	71,4±12,5	5-36	12,4±3,3
Nematoda						
Rhabdias fuscovenosus	75,0±11,2	1-22	3,4±1,5	85,7±9,7	2-145	31,3±13,4
Strongyloides mirzai	12,5±8,5	1	0,13±0,09	42,9±13,7	1-13	2,9±1,3
Nematoda sp., larvae	12,5±8,5	1-5	0,4±0,3	14,3±9,7	1	0,10±0,08
Nematoda sp.1	-	-	-	14,3±9,7	1	6,7±6,6
In total species	14			13		

Note: *EI – extensiveness of an invasion (%), II – intensity of an invasion (exemplar); IAP – an index of abundance of a parasite (exemplar).*

Strongyloides mirzai Singh, 1954 Localization: intestines.

In Russia it is registered in the Samara Region [13]. It is abroad noted in the territory of Ukraine, Armenia, Azerbaijan, Uzbekistan, India. It is tightly specific parasite of Natrix snakes.

At the adult stages *Macrodera longicollis*, A*stiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula* (from Trematoda) and *Rhabdias fuscovenosus* (from Nematoda) have the greatest extensiveness of an invasion.

Among larval forms high extensiveness of an invasion was characteristic for larval stages of Trematoda – *Pharyngostomum cordatum* and *Alaria alata* (tab. 1). Thus, the common natrix in the two studied areas of Mordovia has helminthes typicaly for other regions of the Central Volga Area [13, 15, 22].

Conclusion. We investigated helmintho-fauna of the grass snake *Natrix natrix L.* in territory of the Republic of Mordovia (Russia). 15 species of parasitic worms (from which 11 species concern to class Trematoda and 4 - to class Nematoda) are marked at a reptile. From adult stages the greatest extensiveness of an invasion *Macrodera longicollis, Astiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula (Trematoda)* and *Rhabdias fuscovenosus (Nematoda)* differed. Among larval forms high extensiveness of an invasion was characteristic for larval stages *Pharyngostomum cordatum* and *Alaria alata (Trematoda).*The specific structure of helminths of grass snake from Republic of Mordovia is similar with parasite fauna of the snake from other regions of the Middle Volga region.

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Мордовия қарапайым жылан (Natrix natrix L.) гельминттері

Аңдатпа

2008 жылы Мордовия Республикасы (Ресей) аймақтарында кәдімгі сарыбас жыланның Natrix natrix L. гельминтофаунасы зерттелді. Бауырымен жорғалаушыларда паразиттік құрттардың 15 түрі белгіленіп, оның ішінде 11 түрі Trematoda класына және 4 түрі Nematoda класына жатады. Ересек кезеңінде аса жоғары инвазия экстенсивтілігімен Macrodera longicollis, Astiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula (трематодалар) және Rhabdias fuscovenosus (нематода) ерекшеленді. Дернәсіл түрлерінің арасында жоғары инвазия экстенсивтілігі Pharyngostomum cordatum және Alaria alata трематодаларының дернәсіл түрлеріне тән болды. Мордовия фаунасындағы кәдімгі сарыбас жыланның гельминттерінің түр құрамы Еділдің Орта бойындағы басқа аймақтардағы жылан паразитофаунасына ұқсас.

Түйінді сөздер: *гельминтофауна, қарапайым жыланы (Natrix natrix L.), Trematoda, Nematoda, Macrodera longicollis, Astiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula, Rhabdias fuscovenosus, Pharyngostomum cordatum, Alaria alata.*

Материал баспаға 10.12.23 түсті

Гельминты ужа обыкновенного (Natrix natrix L.) Мордовии

Аннотация

В 2008 году изучена гельминтофауна обыкновенного ужа Natrix natrix L. на территории Республики Мордовия (Россия). У рептилии отмечено 15 видов паразитических червей, из которых 11 видов относятся к классу Trematoda и 4 - к классу Nematoda. Из взрослых стадий наибольшей экстенсивностью инвазии отличались Macrodera longicollis, Astiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula (из трематод) и Rhabdias fuscovenosus (из нематод). Среди личиночных форм высокая экстенсивность инвазии была характерна для личиночных стадий трематод Pharyngostomum cordatum и Alaria alata. Видовой состав гельминтов обыкновенного ужа фауны Мордовии сходен с паразитофауной змеи из других регионов Среднего Поволжья.

Ключевые слова: *гельминтофауна, уж обыкновенный Natrix natrix L., Trematoda, Nematoda, Macrodera longicollis, Astiotrema monticelli, Leptophallus nigrovenosus, Telorchis assula, Rhabdias fuscovenosus, Pharyngostomum cordatum, Alaria alata.*

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