Helminthes of Synantropic Rodents of the Northeast Part of Uzbekistan

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Annotation: For the first time we registered 21 species of helminthes belonging to the classes - cestodes, trematodes, and nematodes - that are parasites of the house mice (*Mus musculus*, Linnaeus, 1758) (18 species) and the gray rat (*Rattus norvegicus*, Berkenhaut, 1769) (11 species) in the territory of Northeastern of Uzbekistan. The total infection of synanthropic rodents was 46.2%. The intensity of invasion by helminthes ranged from 1 to 32 individuals.

Key words: cestodes, nematodes, trematodes, mouse-like, rodents, synanthropic, Uzbekistan.

Introduction

The role of mouse-like individuals in the biocenosis is significant. They consume primary products and invertebrates; constitute the food base of predatory mammals. The epidemiological and epizootological role of mouse-like rodents is well known. Thanks to the work of many scientists, in recent decades, research on parasitic worms of rodents has advanced significantly. In this regard, it was increased interest in the study of helminthes of mouse-like rodents in the general theoretical aspect. The uneven study of the helminthes of mouse-like rodents in certain regions of the world attracts attention. Many regions of Uzbekistan are considerable of interest from the point of view of biogeography, little studied or almost completely unexplored data are still been remained. All this makes, which it is possible to consider the work carried out by us as expedient and relevant. Small mammals, among which the leading place belongs to rodents, from an environmental point of view, are one of the main components of the ecosystem. They beneficial effect to the soil structure and the grass-shrub tier of vegetation; they are the primary production of predatory birds, mammals and many reptiles. However, from a parasitological point of view, mice and rats, which play a negative role in the transmission of viruses and endoparasites, not only animals, but also to humans. Representatives of the family of mouse-like rodents of Muridae Gray, 1821 is an essential biological component of terrestrial ecosystems. In the biogeocenoses of Uzbekistan, they will form stable communities, consisting of 5 species: *Apodemus sylvaticus* Pallas, 1811, *Mus musculus* (Linnaeus, 1758), *Rattus norvegicus* (Berkenhaut, 1769), *Rattus turkestanicus* (Satunin, 1903), *Nesokia indica* (Gray et Hardwicke, 1830), (Shernazarov and others, 2006). They are final and intermediate hosts of a number of parasitic worms (Ryzhikov et al., 1978, 1979).

Helminthological studies of rodents in Uzbekistan were conducted by Davlatov (1970), Koshchanov (1972) and Bykova (2002). The information, given in these works, in the first case, refers to the fauna of the rodent worms of the North-Western region; in the second case they represent the systematic aspects of studying the parasites of house mice and the gray rat of urbanized territories. On peculiar ecosystems of the Northeast region, similar studies of rodents have not been conducted. In this

regard, the study of mouse-like helminthes and their role in the epizootology of helminthases is an important task of zoology and parasitology.

Materials and methods

The material for this work was the collection of parasitic worms from house mice and a gray rat of the Northeast part of Uzbekistan, covering three major administrative regions (Djizak, Syrdarya and Tashkent).

Mice-like rodents were captured by using standard cylinder-shaped trap grooves and traps with live traps (Krivopalov, 2011). Helminthological material was collected during 2016-2019 years by outstanding methods (Scriabin, 1928) of the rodent populations of the studied region.

126 of individuals of *Mus Musculus* species and 108 of individuals of *Rattus norvegicus* individuals were investigated by the method of complete autopsies. The collected worms were studied in the laboratory of the General Parasitology of the Academy of Sciences of the Republic of Uzbekistan. Species identification of parasitic worms is made in accordance with the determinants given in the works of foreign researchers (Ryzhikov et al., 1978, 1979; Anderson, 2000).

When assessing the degree of infestation of rodents with parasites, standard parasitological indicators were used: extensiveness of invasion — EI (%), intensity of invasion — II (species).

Results and discussion

For the mouse-like rodents (*Mus musculus* and *Rattus norvegicus*) in the studied territory of the Northeast of Uzbekistan, we first registered 21 types of helminthes belonging to the classes - cestodes, trematodes and nematodes (table 1).

Table 1

Species composition of helminthes of mouse-like rodents in the studied region

№	Species	Host	
		House mouse	Gray rat
Class *Cestoda Rudolphi*, 1808			
1.	*Catenotaenia cricetorum* (Kirschenblatt, 1949)	+	+
2.	*Catenotaenia pusilla* (Goeze, 1782)	+	+
3.	*Mathevotaenia symmetrica* (Baylis, 1927)	-	+
4.	*Hymenolepus diminuta* (Rudolphi, 1819)	+	+
5.	*Dipylidium caninum* (L., 1758)	-	+
6.	*Taenia hydatigena* (Pallas, 1766)	+	+
7.	*Taenia pisiformis* (Bloch, 1780)	+	+
8.	*Hydatigera taeniaformis* (Batsch, 1786)	+	+
9.	*Mesocestoides lineatus* (Goeze 1782)	+	+
Clacc Trematoda Rudolphi, 1808			
10.	*Brachylaemus aequans* (Looss 1899)	+	-
11.	*Brachylaemus recurvus* (Dujardin 1845)	+	-
Class Nematoda Rudolphi, 1808			
12.	*Heligmosoides ryjikovi* (Nadtochyi et. al., 1971)	+	-
13.	*Heligmosoides polygyrus* (Dujardin, 1845)	+	-
14.	*Ganguleterakis spumosa* (Schneider, 1866)	-	+
15.	*Aspiculuris schulzi* (Popov et Nasarova, 1930)	+	+
16.	*Aspiculuris tetroptera* (Nitsch, 1821)	+	-

17.	*Syphacia obvelata* (Rudolphi 1802)	+	-
18.	*Syphacia stroma* (Linstow 1884)	+	-
19.	*Gongylonema problematicum* (Schulz, 1924)	+	-
20.	*Gongylonema neoplasticum* (Fibiger et ditlevsen 1914)	+	-
21.	*Trichopcephalus muris* (Schrank, 1788)	-	+
Total		18	11

The data shows in the table, that house mice turned out to be infected with 18 species, and gray rats with 11 species of helminthes.

The total infection of synanthropic rodents was 46.2%. The intensity of invasion by helminthes varied from 1 to 32 samples.

In the structure of parasites fauna as studied animals, cestodes (4 species) and nematodes (10 species) prevail. Trematodes are represented by only two species (*Brachylaemus aequans* and *Brachylaemus recurvus*), which were infected only populations of house mice from Zaamin and Bakhmal regions of Jizzakh region.

Some species of parasitic worms, found in rodents of Northeastern Region - *Dipylidium caninum, H. diminuta, T. hydatigena, T.pisiformis, H. taeniaformis, A. tetroptera* - can parasitize in the human body (Ryzhikov and et al., 1978, 1979 ; Matchanov M.N. and et al., 1984; Bykova and et al., 2002).

Thus, it is possible to confirm the special role of the studied rodents in the epizootology and epidemiology of some helminthases of animals and humans.

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