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Ecological-Faunistic Charactarestics Of Helminth Communities Of Domistic Cats (Felis Silvestris Catus) In The Conditions Of The North-West Caucasus

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Abstract. *This article is devoted to the study of the species structures and mechanisms of the formation of helminth communities in domestic cats depending on the conditions of the keeping and the range of feed consumed. Between 2020 and 2023, 60 troupes of cats belonging to different categories were examined, depending on the conditions in which they were kept. 12 species of helminths were found in examined cats. High rate of infection with helminths were revealed: Metorchis albidus, Dipylidium caninum, Taenia crassiceps, Taenia hydatigena, Mesocestoides lineatus, Ancylostoma caninum, Uncinaria stenocephala, Toxascaris leonina, Toxocara mystax, Toxocara canis, Dirofilaria immitis, Dirofilaria repens [5]. The analysis of the results obtained showed that the determining factors for the formation of helminth communities of domestic cats in the region are the conditions of keeping and the species structure of tropic-epizootic relations.*
Key words: *domestic cat, North-West Caucasus, helminths communities, trematodes, cestodes, nematodes, trophic-epizootic relations.*

INTRODUCTION

The relevance of this study lies in the important role that cats play in the life cycles of parasites and the diseases they transmit to humans, domestic, wild and rural animals through the parasites they infect.

The study of domestic cats, their helminth communities, the structure of food chains, is of great autecological importance, because cats are quite susceptible hosts of various helminths. The low level of necessary veterinary care, non-compliance with the correct sanitary and preventive rules, mass migration of animals plays a big role in the spread of parasitic worms at the epidemiological level. The study of helminths of domestic mammals in different regions, the mechanisms of circulation of these parasites depending on the conditions of their maintenance and the environment is devoted to the works of a number of domestic and foreign authors (R.Sh. Delyanova; J.N. Oldman; P.A. Velichkin, F.L. Radun; A.D. Sulimov; A.T. Enzhar; G.F. Kaspranova; C. Chartier, F. Chartier; M. Furth, J. Hoida; I.M. Zubareva; S. Kornas, B. Nowosad; N.S. Bespalova; S.N. Shipilin; G.S. Sivkov, A.V. Sergushin; V.V. Gorokhov, M.S. Bortsova).

Objective: To conduct a comprehensive environmental assessment of helminth communities of domestic cats in the North-West Caucasus.

MATERIALS AND METHODS

By the method of full helminthological autopsies, 60 corpses of domestic cats were examined, they were collected and autopsied in a veterinary clinic. The studied animals were divided into four categories depending on the conditions of keeping cats, 15 specimens of each category: apartment urban cats, apartment rural cats, stray urban cats, stray rural cats. Helminthological necropsy of cats was carried out according to the method of K.I. Scriabin (1928), helminthological analysis of intermediate and reservoir hosts was carried out according to G.A. Kotelnikov (1991). [9]. Determination of the species composition of helminths, their life forms, as well as fragments of animals from the gastrointestinal tract and excrement of carnivores was carried out using keys and monographs by B.S. Vinogradov [2]; V.I. Petrochenko [10]; K.I. Skryabin [11, 12, 13]; K.I. Abuladze [1]; V.M. Ivashkin [3]; D.P. Kozlov [8]; G.A. Kotelnikova [9]; V.E. Sudarikov [14].

RESULTS OF THE STUDY

We have registered 12 species of parasitic worms: trematodes – 1 species, cestodes – 4 species, nematodes – 7 species. In urban apartment cats, 5 species of helminths have been identified, including 1 species of cestodes and 4 species of nematodes.

8 species of helminths have been found in rural apartment cats: cestodes – 3 species and nematodes – 5 species [5].

11 species of parasitic worms have been identified in stray cats living in the city: trematodes - 1 species, cestodes - 3 species, nematodes - 7 species.
12 species of helminths have been registered in stray cats living in rural areas: trematodes – 1 species, cestodes – 4 species, nematodes – 7 species [4]. Figure 1.

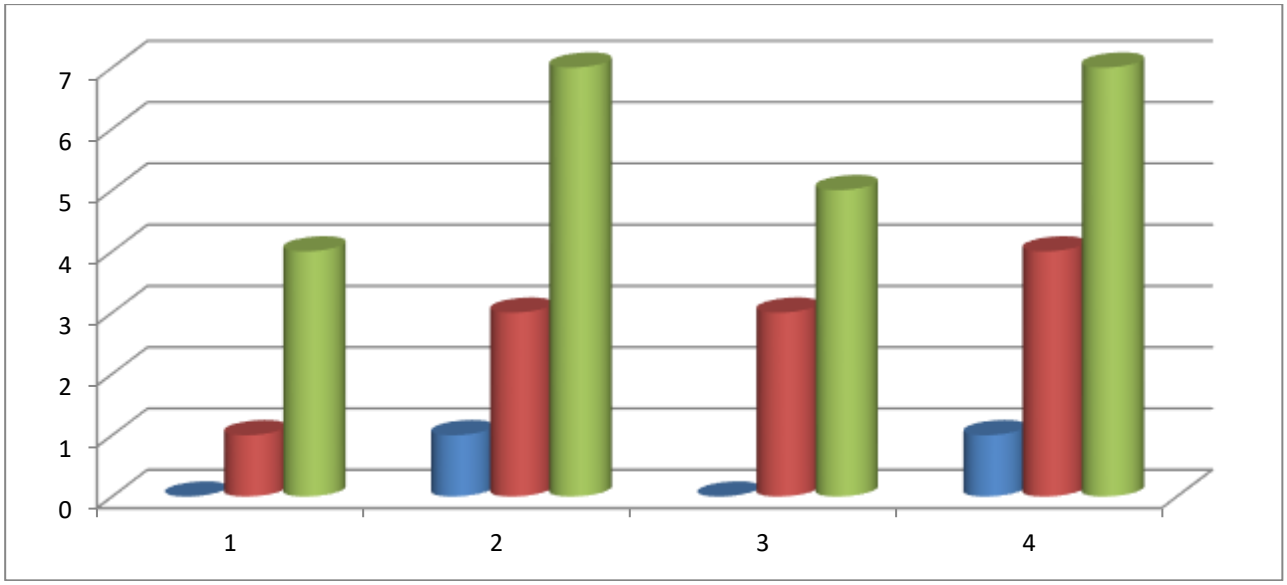

Figure 1: 1 – urban apartment cats, 2 – urban stray cats,
3 – rural apartment cats, 4 – rural stray cats.
Trematodes, Cestods, Nematods
Infection of cats with helminths depending on the conditions of keeping in the North-West Caucasus is shown in Table 1.

Table 1 Infection of cats with helminths depending on the conditions of detention in the North-West Caucasus

Helminths	Apartment Cats (city territory) n = 15		Apartment Cats (rural) n = 15		Homeless Cats (city territory) n = 15		Homeless Cats (rural territory) n = 15	
	AI cf. Copies. min-max	HEY %	AI cf. Copies. min-max	HEY %	AI cf. Copies. min-max	HEY %	AI cf. Copies. min-max	HEY %
Metorchis albidus	0	0	0	0	7,0±1,3 5-9	13,3	6,7±1,8 4-11	26,7
Dipylidium caninum	2,3±0,3 2-3	13,3	3,4±1,1 2-6	33,3	2,7±0,8 1-4	46,7	2,2±0,5 1-3	40,0
Taenia crassiceps	0	0	2,0	6,7	1,8±0,5 1-3	33,3	1,8±0,5 1-3	33,3
Taenia hydatigena	0	0	0	0	0	0	2,0	6,7
Mesocestoides lineatus	0	0	2,5±0,3 2-3	13,3	1,8±0,5 1-3	33,3	1,8±0,5 1-3	40,0
Ancylostoma caninum	0	0	0	0	5,5±1,0 4-7	13,3	6,5±1,0 5-8	13,3
Uncinaria stenocephala	0	0	10,5±2,3 7-14	13,3	4,2±0,7 3-6	26,7	4,2±0,6 3-5	26,7
Toxascaris leonina	5,5±1,0	13,3	5,7±0,8	20,0	5,2±0,9	33,3	5,0±1,1	40,0

	4-7		4-7		4-7		3-7	
Toxocara mystax	4,5±0,3 4-5	13,3	5,0±0,5 4-6	20,0	3,0±0,5 2-4	20,0	3,2±1,0 2-5	26,7
Toxocara canis	0	0	0	0	4,0	6,7	4,5±0,3 4-5	13,3
Dirofilaria immitis	5,0±0,7 4-6	13,3	3,7±0,3 3-4	20,0	4,0±0,7 3-6	33,3	3,0±0,7 2-4	33,3
Dirofilaria repens	2,0	6,7	3,0±0,7 2-4	13,3	3,0±0,5 2-4	20,0	2,7±0,6 2-4	26,7

Note: n is the number of cats examined

The intensity of invasion for most parasites does not differ significantly, with the exception of Uncinaria stenocephala, the intensity of invasion of which is significantly higher in rural apartment cats compared to stray animals, both urban and rural. EI parasites were at their lowest levels in urban apartment cats compared to all other cats from all four study sites. In stray cats of both groups – rural and urban – the EI of most parasites do not differ, the exceptions are Metorchis albidus and Toxocara canis, in which this indicator is 2 times higher in rural stray animals, as well as for Taenia hydatigena, which was not found in urban stray cats.

Infection of cats with these types of helminths can be carried out in apartment conditions, where contact of animals with infected fleas and mosquitoes is possible. Parasitic worms have not been found in urban apartment cats, and this is all due to the conditions of keeping and lack of contact with other animals - wild spines (for example: fish, amphibians, muscles). That is, apartment cats do not leave apartments and eat only ready-made food.In the community of helminths of rural apartment cats, 3 species of cestodes and 5 species of nematodes were found, of which 2 species belong to biohelminths and 3 species are geohelminths.

Fragments of rodents were found in the stomachs of 40.0% of the examined rural apartment cats, and this explains the participation of mouse-like rodents as reservoir hosts in the life cycles of these cestode species.

In the community of helminths of rural apartment cats, relatively high rates of helminth infection were registered: Dipylidium caninum (EI 33.3%), Toxascaris leonina (EI 20.0%), Toxocara mystax (EI 20.0%), Dirofilaria immitis (EI 20.0%). In the helminth community of urban stray cats, high rates of infection with helminths were noted: Dipylidium caninum (EI 46.7%), Taenia crassiceps (EI 33.3%), Mesocestoides lineatus (EI 33.3%), Toxascaris leonina (EI 33.3%), Dirofilaria immitis (EI 33.3%), Toxocara canis (EI 33.3%), Uncinaria stenocephala (EI 26.7%). The infection rate of cats in this category with other types of helminths ranged from 6.7% to 20.0%.

In the component community of helminths of stray cats that feed in rural areas, high rates of helminth infection were revealed: Dipylidium caninum (EI 40.0%), Mesocestoides lineatus (EI 40.0%), Toxascaris leonina (EI 40.0%), Taenia crassiceps (EI 33.3%), Dirofilaria immitis (EI 33.3%), Uncinaria stenocephala (EI 26.7%), Metorchis albidus (EI 26.7%), Toxocara mystax (EI 26.7%), Dirofilaria repens (EI 26.7%).

In the component community of parasitic worms, in stray cats that feed in urban conditions, 6 species of biohelminths have been registered, in the circulation of life forms of which invertebrates (freshwater mollusks, fleas, mosquitoes) and vertebrates (fish, reptiles, mouse-like rodents) participate. Invasive larvae (metacercariae) are found in the muscles of fish, which are additional hosts of this trematode species.In the trematode community of this cat, 5 species of helminths have been identified that can cause direct infection, in addition to the participation of reservoir hosts - mouse-like rodents.The greatest species diversity (12 species) is noted in the trematode community of rural stray cats. The category of living worms includes 7 widespread species, including insects, mollusks, fish, reptiles, rodents. Live worms include trematode (Metorchis albidus), found in 13.3% of animals.

The discovered 5 species of soil-transmitted helminths can develop with the participation of various reservoir hosts, which is reflected in Table 2.

Table 2 The main types of food for domestic cats, depending on the conditions content (based on the results of stomach analysis)

Group Feed	Apartment Cats (city territory) n = 15		Apartment Cats (rural) n = 15		Homeless Cats (city territory) n = 15		Homeless Cats (rural territory) n = 15	
	N	%	N	%	N	%	N	%
Rodents	-	-	6	40,0	12	80,0	14	93,3
Birds	-	-	1	6,7	4	26,7	4	26,7
Reptiles	-	-	3	20,0	6	40,0	6	40,0
Amphibian	-	-	2	13,3	4	26,7	8	53,3
Pisces	-	-	4	26,7	3	20,0	10	66,7

Note: n is the number of cats examined; N is the number of occurrences of these feeds in the stomachs

DISCUSSION

Analysis of helminth communities of cats of various groups showed the following. In the community of helminths of urban apartment cats, 3 species of biohelminths were registered: Dipylidium caninum, Dirofilaria immitis and Dirofilaria repens.Analysis of the results showed that helminth monoinvasions were detected in 21.7% of the examined cats in the region. In 37.0% of cats, species infracommunities of helminths were revealed, including two-species communities - 25.0%, three-species communities - 25.0%; four-species - 11.7%, five-species - 1.7%.Analysis of the results shows that out of 12 species of parasitic worms identified in cats, 7 species belong to biohelminths, invertebrates and vertebrates participate in their circulation. The category of soil-transmitted helminths includes 5 species, according to the literature and our data, mouse-like rodents can participate in their life cycles as reservoir hosts [4, 7].Analysis of the results of helminthological studies showed that the species structure of cat helminth communities is determined by the conditions of keeping and the peculiarities of animal nutrition. The minimum species diversity of helminths (5 species) was found in urban apartment cats [6].

Analysis of the stomach contents of the examined urban stray cats showed that the proportion of fish fragments was 20.0%, reptiles – 40.0%, rodents – 80.0%.Analysis of the stomach contents of cats of the studied groups showed that in terms of reducing the frequency of encounters of various food in the stomachs of cats of rural apartment and homeless urban cats, food organisms are located as follows: rodents > fish > reptiles > amphibians > birds. In the stomachs of rural stray cats, food organisms are found in a slightly different order: rodents > fish > amphibians > reptiles > birds. At the same time, the most and least frequently detected food organisms in animals of all three groups are the same.When comparing helminth communities in cats with different housing conditions, it was found that in urban apartment cats, the average values of AI are 0 – 5.0 and EI 6.7 – 13.3%. In rural apartment cats, AI is 0 – 10.5 ind. and EI 6.7 – 33.3%. In urban stray cats, AI 0 – 7.0 and EI 6.7 – 46.7%. In rural stray cats, AI 1.8 – 6.7 and EI 6.7 – 40.0%.

CONCLUSION

High infestation of cats with helminths: Dipylidium caninum average EI values were 33.3%, Toxascaris leonina (EI 26.6%), Toxocara mystax (EI 20.0%), Dirofilaria immitis (EI 25.0%), Dirofilaria repens (EI 16.8%) were registered in the region. These helminth species were detected in all studied categories of cats.

The circulation of most species of helminths in cats, especially stray ones, is carried out along trophic chains, which are also epizootic. Thus, the composition of feline helminth communities in the region is determined by the species structure of trophic-epizootic chains, the links of which, in addition to domestic cats (definitive hosts), are intermediate, additional and reservoir helminth hosts.

REFERENCES

1.Abuladze K.M. Taeniats are tapeworms of animals and humans and the diseases caused by them. /K.I. Abuladze. — Osnovy cestodologii. M.: Nauka, 1964. — T. 4. — 530 p.
2.Vinogradov B.S., Gromov I.M. Kratkiy opreditel gryzunov fauny SSSR [A brief guide to the rodents of the USSR fauna]. — M.; Leningrad, AN SSSR Publ., 1956. — 120 p.
3.Ivashkin V.M. Methods of collecting and studying helminths of terrestrial mammals. Ivashkin, V.L. Kontrimavichus, N.S. Nazarova. — Moscow: Nauka, 1971. — 123 p.
4.Itin, G.S. Features of helminthocenoses of wild predatory mammals in landscape-geographical zones of the North-West Caucasus: dis ... Cand. Biol. Nauk: 03.02.08 / Itin Gennady Semenovich – Krasnodar, 2014. – 172 p.
5.Itin G.S., Influence of trophic relations on the formation of cestode fauna in wild predatory mammals in the conditions of the North-West Caucasus / Takha A.D.S.F., Plotnikov G.K. // Ecological Bulletin of the North Caucasus. 2025. T. 21. № 2. pp. 92-98
6.Itin G.S., Ecological and faunistic characteristics of helminth communities of the common badger (Meles meles l.) in the conditions of the North-West Caucasus / S.F.T. Al-Dulaimi, G.K. Plotnikov, // Ecological Bulletin of the North Caucasus. Krasnodar, Kubgau, 2024. T. 20. No 3. Pp. 115-121.
7.Itin G.S., Ecological and faunistic characteristics of helminth communities of the common jackal (Canis aureus l., 1758) in the ecosystems of the North-West Caucasus / S.F.T. Al-Dulaimi, G.K. Plotnikov, // Ecological Bulletin of the North Caucasus. Krasnodar, KubGau, 2024. T. 20. No 4. Pp. 79-86.
8.Kozlov D.P. Opreditel helmintov ravennykh mammalikh USSR / D.P. Kozlov — M., 1977.— 275 p.
9.Kotelnikov G.A. Metody helmintologicheskikh issledovaniy ob'ektov okruzhayushchikh sredy (pochva, sludge svod, silt, navung, ovoshchi, frukty, yagody, stolovaya zelen', pasture grass, voda otkrytykh vodoemov) [Methods of helminthological studies of environmental objects (soil, sediments of wastewater, silt, manure, vegetables, fruits, berries, table greenery, pasture grass, water of open reservoirs)]. Moscow, Rosagropromizdat Publ., 1991. — S. 21—42.
10. Petrochenko V.I. Acanthocephaly of domestic and wild animals. Moscow, AN SSSR Publ., 1958. — T. 2. — 458 p.
11. Skryabin K.I. Oxurates. Fundamentals of nematologii / K.I. Skryabin, N.P. Shikhobalova, E.A. Lagodovskaya. — M: AN SSSR, 1960. — T.8. — Ch.5. — 557 p.
12. Skryabin K.I., Spirurats of animals and humans and diseases caused by them. Fundamentals of nematodology / K.I. Skryabin, A.L. Sobolev. — Moscow; Academy of Sciences of the USSR, 1964. — Vol. 12. — 334 p.
13. Skryabin K.I. Animal and human spirurates and diseases caused by them. Osnovy nematodologii / K.I.Skryabin, AA Sobolev, V.M. Ivashkin. — M.: AN SSSR, 1967. — T. 19. Ch.5. — 239 p.
14. Sudarikov V.E., Shigin A.A., Kurochkin Yu.V. et al. — Moscow: Nauka, 2002. — T. 1. — 298 p.