

# Cestode *Khawia sinensis* (hsü, 1935) contamination of the catch fish in the water bodies of Surkhandarya region

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**Abstract.** In this article, the infection of fish found in the southern water basins of Uzbekistan by *Khawia Sinensis* (Hsü., 1935) belonging to the cestode class, the effect of cestode larvae on the fish organism, the cycle of development of cestode, the course of the disease according to the seasons and pathogenetic characteristics are discussed.

## 1 Introduction

Today, intensive methods of fisheries development are being developed in our republic in order to provide the population with high-quality fish and fish products. As a result of the program measures implemented in this direction, certain achievements were achieved. The number of species of fish caught in the basins has been increased to several. A number of achievements have been made in researches aimed at studying the distribution and biological features of common fish species in our country. At the same time, insufficient attention has been paid to the factors that have a negative effect on the productivity of fish, especially to the study of cestodes infection of fish, prevention and treatment of the disease [1-27].

In recent years, the government of our republic has paid great attention to the fishing industry in order to solve food problems. Among them, the Decree of the President of the Republic of Uzbekistan No. PF-60 of January 28, 2022 "On the Development Strategy of New Uzbekistan for 2022 - 2026", No. PQ-2939 of May 1, 2017 "Decision "On measures to improve the management system of the fishing network", Decision No. PQ-3657 dated April 6, 2018 "On additional measures for the rapid development of the fishing network", Decision No. PQ-4005 dated November 6, 2018 "On additional measures for the further development of the fishing industry" and No. PQ-83 dated January 13, 2022 "Additional measures for the further development of the fishing industry" the decision on measures" and other regulatory legal documents related to this activity, in the development of fisheries, providing the population with high-quality, ecologically clean fish and fish products is also defined as an important task.

One of the factors that hinders the development of fishing, the increase of quality fish products and the increase in productivity is the infection of fish with helminths. Infection of most fish with these parasites leads to a certain reduction in their number, and sometimes

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mass death of young fish. Some fish species act as intermediate hosts of parasites and participate in ensuring the stability of the epidemiological and epizootological process [2, 4, 7, 11, 19, 23].

## **2 Materials and Methods**

Research work was carried out during 2022-2024 on cystosis infection of game fish collected from different types of reservoirs in the southern regions of Uzbekistan. The material was collected from 1173 specimens of fish belonging to 10 species, collected from natural water bodies and pond farms. In the spring and summer season of 2023-2023, 41 out of 736 fish belonging to 4 species were infected with *Khawia*. During the research, the method of complete and incomplete helminthological analysis was used in the parasitological examination of fish [7]. Generally accepted methods were used for the collection, fixation and processing of helminthes [23].

70% ethyl alcohol and 4% formalin solution were used for fixation of cestodes collected from fish. To determine the species composition of the found cestodes, the identifier literature was used [4].

## **3 Results and Discussion**

Caviosis is a helminthic disease of carp, mainly common in carp, carp and their hybrids, white and black carp. This disease is characterized by damage to the intestines.

According to the results of our research, carp fishes switch to benthos feeding in late May-June, and they are infected with caviosis by eating the infected oligochaetes preserved in the water bottom of the previous year. In July-August, the disease was observed in these young fish. The highest extent of invasion with *Khawia sinensis* cestode in the southern water bodies of Uzbekistan was 3.5-5.5%, and the intensity of invasion was 2-5 times.

By September, the extent of damage will decrease, but a new wave of invasion may be recorded in autumn. 2-year-old fish are infected in the spring, and the level of infection reaches the maximum by the middle of summer. Adult fish are carriers of helminths. Due to the fact that the muddy bottom of the reservoir eats a lot of worms for the spread of infestation, the probability of their infection with helminths increases. Helminths are kept in a passive state in the body of fish during the winter, but with the arrival of spring they become active and begin to lay eggs.

Diseased fish are less active, their movement is limited. They stay for a long time on the shores of ponds, in shallow places. The mucous membranes of the skin are anemic and blurred, the abdomen is swollen, and the back exit hole is red. The manifestation of clinical signs directly depends on the intensity of invasion. His nutrition is greatly reduced and he loses weight. The amount of hemoglobin in the blood decreases. All this has a negative effect on the productivity of fish, productivity and quality decrease. When fish are intensively infected (dozens of caviar), it causes death among young fish. Mortality is rarely observed in adult fish.

The parasite fills and closes the intestinal cavity, damages the mucous membrane. This prevents the movement of food. As a result, digestion, i.e. metabolism, fails. Metabolic poisoning occurs in the body [19].

In the spring and summer season of 2022-2023, materials for our research were collected from the banks of the Surkhan River flowing through the Surkhandarya region, South Surkhan Reservoir, Uchkizil Reservoir and the surrounding fisheries. Fish infected with *cavioza* belong to 4 species, and the most cases of infestation were studied in the spring and summer seasons.

At the beginning of the spring season of 2022, out of a total of 189 fish, 76 carp, 34 carp, 61 white carp, and 18 black carp were completely and incompletely examined. As a result, 4 out of 76 carp (5.26%) had 1-3 copies, 2 out of 34 carp (5.88%) had 2-5 copies, 3 out of 61 white carp (4.91%) had 1- In 3 copies and 1 out of 18 black carp fish (5.5%) 1-2 copies were infected with caviosis.

In the spring season of 2023, a total of 125 fish will be tested, including 48 carp, 20 carp, 42 white carp and 15 black carp. According to the inspection results, 3 out of 48 carp (6.25%) have 1-6 copies, 1 out of 20 carp (5%) has 2-5 copies, 2 out of 42 white carp (4.76%) have 1-3 and 1 out of 15 black carp (6.6%) was found to be infected with *Khawia sinensis* cestode in 1-4 copies (Table 1).

The extent of infestation (IE-the percentage of infected fish compared to the total fish examined) and the intensity of infestation (II-arithmetic average of the number of parasites per one infected fish) were used to evaluate the damage of the examined fish. [6].

**Table 1.** Results of inspection of fish infected with cestodes *Khawia sinensis* during the spring season of 2022-2023

№	Botanical name of the examined fish	Number of fish examined (in pcs)		2022		2023	
		2022	2023	IE (%)	II (Copy)	IE (%)	II (Copy)
1	<i>Cyprinus carpio</i> Linnaeus, 1758	76	48	5,26	1-3	6,25	1-6
2	<i>Cyprinus carpio</i> Linnaeus, 1758	34	20	5,88	2-5	5,0	2-5
3	<i>Ctenopharyngodon idella</i> – Vallenciennes,1866	61	42	4,91	1-3	4,76	1-3
4	<i>Mylopharyngodon piceus</i> - Richardson,1846	18	15	5,5	1-2	6,6	1-4
	Total:	189	125	5,38	1-3	5,65	1-4

The next inspections were conducted in July-August 2022. In this season, the inspection of the damage to the fishes by cavios is somewhat successful, and during this period, according to the characteristics of the fish, it is caught a lot. In this season, a total of 260 fish, including 106 carp, 53 carp, 80 white carp and 21 black carp, were helminthologically examined. As a result, 7 of 106 carp (6.6%) had 2-6 copies, 3 of 53 carp (5.66%) had 1-5 copies, 5 of 80 white carp (6.25%) had 1- In 4 copies and in 1 out of 21 black carp fish (4.76%), 1-3 fish were infected with caviosis.

In the summer season of 2023, a total of 162 fish will be tested, including 78 carp, 29 carp, 44 white carp and 11 black carp. According to the inspection results, 5 out of 78 carp (6.41%) have 2-5 copies, 2 out of 29 carp (6.89%) have 1-4 copies, 3 out of 44 white carp (6.81%) have 1 It was noted that 3 copies were affected by the disease. In 1 out of 11 black carp (9.09%), 1-2 copies of the disease were detected (Table 2).

**Table 2.** Results of inspection of fish infected with cestodes *Khawia sinensis* during the summer season of 2022-2023

№	Botanical name of the examined fish	Number of fish examined (in pcs)		2022		2023 yil	
		2022	2023	IE (%)	II (Copy)	IE (%)	II (Copy)
1	<i>Cyprinus carpio</i> Linnaeus, 1758	106	78	6,6	2-6	6,41	2-5
2	<i>Cyprinus carpio</i> Linnaeus, 1758	53	29	6,66	1-5	6,89	1-4

3	Ctenopharyngodon idella – Vallenciennes,1866	80	44	6,25	1-4	6,81	1-4
4	Mylopharyngodon piceus- Richardson,1846	21	11	4,76	1-3	9,09	1-2
	Total:	260	125	6,06	1-4	7,3	1-4

Analyzing the collected data, mainly carp and their hybrids are affected by *Khawia sinensis* cestodes in natural water bodies and ponds. It was noted that damage occurs mainly among young fish, they start to get damaged in 1-2 weeks after they start feeding on olegachets. Damage to fish increases in May-June. In July-August, the invasion reaches the highest level of extensiveness.

*Khawia sinensis* cestode larvae settle in the serous membranes of the body cavity of fishes, between internal organs and on the wall of the intestines, they slow down the normal flow of blood by compressing the metabolism and sometimes the blood vessels of the fishes [2].

When young fish are affected, they lag behind in growth and development, and we observed that their weight is slightly reduced compared to healthy fish. It was noted that infected one-year-old fish had a bad winter and often died.

In the fight against caviasis of fishes, small hairy worms are eliminated by drying and freezing ponds and by deinfestation using unslaked (25-30 s/ha) or chlorinated lime (5 s/ha). Albendazol, panafenb 22.2%, monezol drugs are used as anthelmintic agents. Monezol drug is added to feed pellets. The therapeutic dose of Monezol is 0.25-0.30 g/kg. When the disease is detected, treatment and preventive measures are mandatory. Fish from unsanitary farms are not allowed to enter, and strict controls are established when transporting fish from one place to another.

## 4 Conclusion

Based on the results of this research, the following conclusions can be drawn: infestation of fish with *Khawia sinensis* cestode larvae can be observed in spring, summer and autumn; the highest level of damage was observed at the end of the summer season; damage was recorded in all types of water bodies; it was found that damage in pond farms is relatively high.

The reason is because of the high density of fish. All collected data were analyzed.

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