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INFECTION OF CARP FISH WITH PHILOMETROIDOSIS AND ITS EFFECT ON FISH GROWTH AND DEVELOPMENT

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Abstract
This article provides detailed information on the infestation of carp (Cyprinus carpio L.) inhabiting the Zarafshan River in the Samarkand region with Philometroides nematodes (filometroidosis), the changes observed in infected fish, their biological characteristics, and the effects of this parasitic infestation on fish growth and development.

Keywords: Fish, carp, philometroidosis, parasite, nematode, fish farms.

Introduction

Sustainable management of aquatic bioresources and their biological productivity is one of the main scientific and practical directions of modern aquaculture. In this process, an in-depth study of fish parasitic systems, identification of their mechanisms of influence on the host organism, and analysis of the ecological and physiological bases of parasite–fish relationships are among the most relevant scientific issues. From this perspective, philometroidosis, caused by nematode-class pathogens, belongs to the group of obligate metazoan invasions widely spread among carp (Cyprinus carpio L.) species. Philometras parasitize in the muscles, fins, subcutaneous tissues, or reproductive organs of fish, significantly altering the morphological and physiological state of the organism. During the localization, growth, and reproduction of parasites within the host body, toxic metabolites are produced, leading to immuno-biochemical stress, hematological dysfunction, and energetic imbalance. The localization of philometroidosis invasion in the gonads disrupts the reproductive cycle, endocrine regulation, and hematogenesis processes of fish, which limits the natural renewal of the population. In recent years, morphometric and molecular studies conducted in Central Asian water bodies (Karimov et al., 2023; Moravec, 1994) have identified Philometra cyprinid, Philometra ovata, and Philometra lusiana species parasitizing in carp fish. The spread of the parasite is closely related to ecological conditions such as water temperature, oxygen regime, and the population dynamics of the intermediate host. In particular, an increase in invasion intensity and invasion pressure is observed when the water temperature ranges between 25–30°C.

Materials and Methods

The study was conducted in August, September, and October of 2025 at the “Poultry, Rabbit, Fish and Bee Diseases” Laboratory of the Scientific-research institute of Veterinary located in the Taylak district of Samarkand region. For the research, 10 specimens of carp (Cyprinus carpio L.), belonging to the Cyprinidae family, were collected from the Zarafshan River in the Samarkand region.

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The samples were kept in the Experimental Fish Pond of the Institute, where observation studies were carried out. Morphometric monitoring analyses of the fish were performed at 10-day intervals. During the life cycle of the fish, the effects of philometras on their organism were analyzed, and the clinical signs of the disease were studied.

Results and Their Analysis

Experimental scientific observations conducted from August to October 2025 revealed that the mass of the fish increased from 1307.6±1.35 g to 1377.4±1.35 g, which corresponds to an overall increase of 5.3%. The standard body length increased from 33.2±1.54 cm to 37.6±0.45 cm. The obtained results were calculated based on the W.E. Ricker (1975) equation.

This research aimed to determine the effect of Philometra (a parasitic nematode) infestation on the natural growth process of fish. The experiment was evaluated according to the equation proposed by W.E. Ricker (1975):

Table 1 Results of three-month morphometric analyses of 10 carp (Cyprinus carpio L.) collected from the Zarafshan River

№	Date of sample measurement recorded	Fish weight (g)	Standard length (cm)	Horizontal length (cm)
1	1.08.2025	1307,6±1,38	33,2±1,25	16,3±1,54
2	10.08.2025	1325,5±1,23	36,6±0,72	17,9±0,80
3	20.08.2025	1343,7±1,25	36,8±0.70	17.1±0.57
4	30.08.2025	1346,9±0,60	36,9±1,71	17,2±0.41
5	10.09.2025	1350,6±1.18	37,1±0,49	17,3±0,37
6	20.09.2025	1359,2±1.23	37,2±0,50	17,4±0,40
7	30.09.2025	1371,5±1,77	37,3±0,46	17,5±0,38
8	10.10.2025	1377,4±1,35	37,6±0,45	17,6±0,38

This equation allows determining isometric ($b = 3$) and allometric ($b \neq 3$) growth. The study results showed a value of ($b < 3$), indicating negative allometric growth in the fish. Filometroidosis infection slowed metabolic processes, reduced nutrient absorption, and disrupted energy balance in the fish. This led to disproportionate morphometric development. Additionally, filometroidosis weakened the fish's immunobiological defense mechanisms, creating conditions for the development of secondary infections.

Overall, the conducted scientific experiment showed that filometroidosis is an important biological factor disrupting the natural growth of fish.

Observations showed that filometroidosis (parasitic nematode) infection had a significant negative impact on the natural development of fish. The parasite infection slowed metabolic processes, reduced nutrient absorption, and disrupted energy metabolism in the fish. As a result, the natural growth rate of body mass decreased, leading to a negative allometric trend due to relatively faster growth in body length. Additionally, filometroidosis increased physiological stress, reduced immunobiological stability, and caused a redistribution of energetic resources in the fish. This disrupted the natural dynamics of growth coefficients and led to reduced biological productivity at the population level. The trend identified through morphometric measurements scientifically

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confirms the direct role of parasites in the ecological balance of fish populations.

Conclusions:

1. The results of the conducted scientific experiment show that filometroidosis is an important ecological factor that disrupts the natural ontogenetic development of fish and alters the allometric characteristics of their growth.
2. Under the influence of the parasite, body mass does not increase sufficiently, morphometric proportions develop disproportionately, and the overall physiological condition of the organism weakens. Therefore, parasitological monitoring, hygienic control, and preventive measures must be systematically implemented to ensure the healthy growth of fish in water bodies.

References:

1. Moravec, F. (2006). Dracunculoid and anguillicoloid nematodes parasitic in vertebrates. Academia, Prague.
2. Fiala, I., Dyková, I., & Moravec, F. (2018). Molecular phylogeny of Philometridae: A review. Parasitology International, 67(5), 507–514.
3. Anderson, R.C. (2000). Nematode Parasites of Vertebrates: Their Development and Transmission. CABI Publishing.
4. Moravec, F., & de Buron, I. (2013). The systematics of Philometridae: challenges and perspectives. Folia Parasitologica, 60(4), 305–318.
5. Paperna, I. (1996). Parasites, infections and diseases of fishes in Africa. CIFA Technical Paper, FAO.
6. Быховская-Павловская, И.Е. (1985). Паразиты рыб: Определителъ. Ленинград: Наука.
7. Shamsiev, A., va boshq. (2022). O‘zbekiston suv havzalarida baliq parazitlarining biologik xususiyatlari. Tashkent: Fan.
8. Moravec, F. (2006). Philometrid nematodes of fishes: A review. Folia Parasitologica, 53(1), 1–36.

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