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EFFECTIVENESS OF DRUG PREPARATIONS AGAINST FISH NEMATODOSIS

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Abstract
The purpose of this research is to study the effect of Albendazole 10% and the anthelmintic drugs 2-propidamisole (powder), 2-acetamisole (powder) developed by scientists at the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan on nematodes of the gastrointestinal tract of fish

Keywords: Albendazole, Propydamisole, Acetamisole, Anthelmintic, Stomach, Intestines, Nematodes.

Introduction

Nowadays, much attention is being paid to the fisheries sector in our Republic, especially to aquaculture issues. In a context of rapid development of fisheries in our country, the issue of the spread of infectious and invasive diseases in fish remains relevant in the context of increasing fish stocks, cultivating food fish species, and introducing new fish farming methods.

The production of highly effective biologically safe anthelmintic drugs for the prevention of livestock and their product indicators and the protection of animals from various helminthiasis is one of the urgent problems of today (Saidov S.S. et al. 2019).

Today, in the pharmaceutical market, powerful chemical preparations designed to fight against helminths are widely used. Many local and foreign organic anthelmintic drugs (albendazole, timbendazole, medapek, etc.) are highly biologically effective for combating animal helminthiasis, especially nematodes (Arkhipov I.A., 2019).

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Typically, fish heavily infected with parasitic helminths do not eat well, show reduced growth, discolouration, and show signs of reduced mucus secretion, resulting in increased susceptibility to other bacterial pathogens in the water (Kayis et al., 2009; Wang et al., 2008). Formalin, copper sulfate, and potassium permanganate solutions are commonly used to treat parasitic helminths in fish (Crigel et al., 1995, Thoney, 1990, Sharp et al., 2004, Mehlhorn et al., 1988). Therefore, the need for alternative chemical treatments and control methods that are more effective and sustainable has increased significantly in recent years.

In recent years, the drug Praziquantel has been used to treat various parasites in humans, animals, and fish (Mitchell, 2004). Several studies have investigated the efficacy and safety of this chemical against fish parasites (Chisholm and Whittington, 2002; Janse and Borgsteede, 2003; Katharios et al., 2006; Van et al., 2012).

Recently, chemical preparations with a broad spectrum of action produced in Uzbekistan have been tested against lungworms in livestock, including a 2.5% (aqueous) solution of the drug Medapek, produced at the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan (Kuchboev A.E., 2009). In addition, extracts from local plants used in folk medicine and with anthelmintic properties, such as the root of the stinking ferula (Ferula foetida), creeping bitter gourd, cakra (Acroptilan repens), and peach (Persica vulgaris), have been recommended for use as an effective means of combating gastrointestinal nematodes in the prevention of nematodes in ruminants (Amirov O.O., 2021).

The purpose of this research is to study the effect of Albendazole 10% and the anthelmintic drugs 2-propidamisole (powder), 2-acetamisole (powder) developed by scientists at the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan on nematodes of the gastrointestinal tract of fish.

Material and Methodology

To determine the biological effectiveness of drugs against nematodes in the gastrointestinal tract of fish, Albendazole 10% and the anthelmintic drugs 2-propydamisole (powder), 2-acetamisole (powder) developed by scientists at the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan were used. The experiment was conducted on fish raised in fish farms in the Khorezm region. In this experiment, 70 one- and two-year-old fish with enlarged abdomens that swim on the surface of the water were selected. Albendazole 10% (5 kg of medicine per 1 ton of bait) orally when giving drugs to fish; 2-propidamizole (powder) (5 kg drug for 1 ton feed), 2-acetamizole (powder) (5 kg drug for 1 ton feed) orally, drugs were given. The experiment was conducted for 10 days, with 3 groups of 20 fish each for the experiment and 10 fish for the control.

The results were statistically analyzed using a computer using Microsoft Excel.

Results Obtained and Their Analysis

To carry out this research, 10 fish that were swimming on the surface of the water and had an enlarged abdomen were examined using complete and incomplete helminthological methods before the experiment, which was conducted in fish farms located in the Khorezm region of our Republic (Table 1).

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Table 1 Results of helminthological inspection of experimental fish

№	Type, gender	Age	Weight, in grams	Helminth found organ	Number of detected nematodes
1	Carp, ♀	1	380		8
2	Carp, ♀	2	520	Stomach, intestines	11
3	Carp, ♀	2	450	Stomach, intestines	13
4	Carp, ♂	2	490	-	-
5	Carp, ♂	1	360	Stomach, intestines	7
6	Carp, ♀	2	540	-	-
7	Carp, ♀	2	470	Stomach, intestines	9
8	Carp, ♂	2	500	Stomach, intestines	15
9	Carp, ♂	2	450	Stomach, intestines	5
10	Carp, ♀	1	380	-	-

According to the results of the helminthological study, out of 10 fish examined in the stomach and intestines of 1- and 2-year-old fish, nematode larvae were detected in 7 of them, with an extensive infestation of 70% and an infestation intensity of 5-15 copies.

For the experiment conducted to determine the biological effectiveness of anthelmintic drugs, 70 fish were given each anthelmintic drug once in the morning, mixed with 0.05 g/1 kg of fish body weight, and after 10 days, the experimental fish were examined using the complete and incomplete helminthological dissection method to determine the biological effectiveness of the anthelmintic drugs (Table 2).

Table 2 Biological effectiveness of anthelmintic drugs

Experimental group and anthelmintic drugs	Number of fish in the experiment	Fish type/age/weight (g)	Drug dose, 5kg/1ton	Research results, 10 days	Effectiveness of drugs, number, (%) average	
				Number of nematodes		
Group I Albendazole 10%	20	Carp/1-2/320-530	0.05g/1kg	3-8	16	80
Group II 2-propidamizole	20	Carp/1-2/315-525	0.05g/1kg	3-6	17	85
Group III 2-acetamizol	20	Carp/1-2/330-510	0.05g/1kg	2-3	18	90
Group IV Control	10	Carp/1-2/340-570	-	3-11	10	0

According to the results of the experiment, 10 days after the drug was administered, nematode larvae were detected in 4 out of 20 fish in the first group, with an average biological efficacy of 80% for the 10% Albendazole drug, 3 out of 20 fish in the second group with 2-propydamidazole drug, with an average biological efficacy of 85%, and 2 out of 20 fish in the third group with 2-acetamiazole drug, with an average biological efficacy of 90%. Nematode larvae were detected in 7 of the experimental fish in the fourth group.

Conclusion

According to the results of the study, the drugs 2-propydamidazole and 2-acetamiazole, which have anthelmintic properties, can be recommended for use as an effective means of combating gastrointestinal nematodes in fish.

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