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ENDOPARASITIC FAUNA OF SOME COMMERCIALLY IMPORTANT FISH SPECIES FROM MENZELET DAM LAKE (KAHRAMANMARAŞ, TURKEY)

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Abstract: *This study aims to determine the endoparasitic fauna of seven species of freshwater fish from Menzelet Dam Lake in Kahramanmaraş, Turkey. Cyprinus carpio, Barbus rajanorum, Alburnus sp., Capoeta angorae, Capoeta barroisi, Leuciscus cephalus and Luciobarbus pectoralis caught in the Dam Lake were examined in terms of internal parasites. Neoecinorhynchus rutili (Acanthocephala: Neoechinorhynchidae) and Ligula intestinalis (Cestoda: Pseudophyllidea) endoparasites were found. Parasites were stained and pictures were taken under a microscope. The distribution of parasites is presented according to ecological terms.*
Key words: *Menzelet Dam Lake, Fish, Neoechinorhynchus rutili, Ligula intestinalis*

1. Introduction

The fact that Turkey has a large inland water potential with variable ecological aspects allows for the cultivation of a variety of fish. The decline of fish species with an economic value in our seas due to pollution by the discharge of domestic and industrial wastewater and ignorant hunting have made it necessary to protect and improve the existing fish stocks in inland waters. Fish diseases are one of the factors that negatively affect fishing in our country's lakes and ponds. Diseases caused by parasites constitute a large part of fish diseases [1].

Fish take first place in aquaculture in terms of protein and vitamin values they contain. Juvenile or adult fish farmed in the natural environment or in culture in order to meet the need for protein are infected by parasites through direct contact with parasitic fishes or by means of nutrients. As known, parasitism cases can lead to decreased fertility, weakness or even death in the host organism. For this reason, studies aiming to detect parasitic fauna of fish in natural environments are of great importance in terms of taking measures for coping and protecting against parasites [2].

Approximately 10,000 parasite species live in fish and of these parasite species, 27% include Crustacea, 18% Protozoa, 15% Monogenea, 17% Trematoda, 10% Cestoda, 7% Nematoda, 4% Acanthocephala and 1% include Huridinea groups [3].

Commercially important fish species in Menzelet dam lake are *Silurus glanis, Cyprinus carpio, Barbus rajanorum, Capoeta capoeta, Capoeta barroisi* and *Leuciscus cephalus* [4].

This study was carried out to determine the internal parasitic fauna of *Cyprinus carpio, Barbus rajanorum, Alburnus sp., Capoeta angorae, Capoeta barroisi, Leuciscus cephalus* and *Luciobarbus pectoralis* species from Menzelet Dam Lake (Kahramanmaraş).

2. Material and Methods

1113 fish (36 *Cyprinus carpio,* 449 *Barbus rajanorum,* 60 *Alburnus sp.,*78 *Capoeta angorae,* 332 *Capoeta barroisi,* 150 *Luciobarbus pectoralis* and 8 *Leuciscus cephalus*) caught in Menzelet Dam Lake (Fig. 1) with gill nets between January and August of 2013 were transported alive in plastic buckets to the Fish Diseases Laboratory in the Department of Aquaculture of Agricultural Faculty in Kahramanmaraş Sütçü Imam University and examined parasitological after being anaesthetized with 2-phenoxyethanol. The mean weight and total lenght of samples ranged 25,51cm and 198,84 g for *Cyprinus carpio;* 25,93 cm and 210,99 g for *Barbus rajanorum;* 12,87 cm and 26,09 g for *Alburnus sp;* 17,80 cm and 55,73g for *Capoeta angorae;* 30,55 cm and 301,01g for *Capoeta barroisi;*18,47 cm and 46,03 g for *Luciobarbus pectoralis*; 26,9 cm and 235 g for *Leuciscus cephalus.* The internal examinations of the fish were performed by autopsy technique [5]. The abdomen of the fish was cut from the anus to the isthmus and the stomach and intestines were transferred into petri-dishes containing physiological water. The parasites that were found were stained with aceto-carmine after going through alcohol series and their indefinite sections were prepared. Inspection, detection, preparation, and diagnosis of parasites were identified by using Bauer [6], Bykhovskaya-Pavlovskaya [7], Cheng [8], Chubb et al. [9], Reinhenbach-Klinke [10], Hoffman [11], Kennedy [12] and Ekingen [13]. According to Bush et al. [17] prevalence, mean intensity and mean abundance was calculated by the following formulas.

Prevalence =Number of parasitic fishes / Total number of fishes x 100

Average density = Total number of parasites / Number of parasitic fish

Average abundance = Total number of parasites / Total number of fish

Figure 1. Locations of sampling sites in Menzelet Dam Lake

3. Results

In this study, 1113 fish samples of 7 species were examined. 2 species of parasites (1 acanthocephalan and 1 cestoda species) were found in 490 of these fishes examined and a total of 14614 parasite samples were detected. Both parasite species were found in other all fish species except *C. barroisi*. In *C. barroisi*, only *N. rutili* was determined. While the most common among the parasite species infecting the fish is *Neoechinorhynchus rutili* (Fig. 2) (14575) and *Ligula intestinalis* plerocercoid (Fig. 3) (39) have been the least common (Tab. 1).

Ligula intestinalis is a pseudophyllidean cestode that in its plerocercoid stage infests freshwater fish species. These are tapeworms that are effective in both marine and freshwater environments. Their bodies are segmented. They are hermaphrodites and their digestive and excretory systems are relatively well developed. Their need for invertebrates as intermediate hosts is possible the reason why they are less prevalent in aquaculture environments [16].

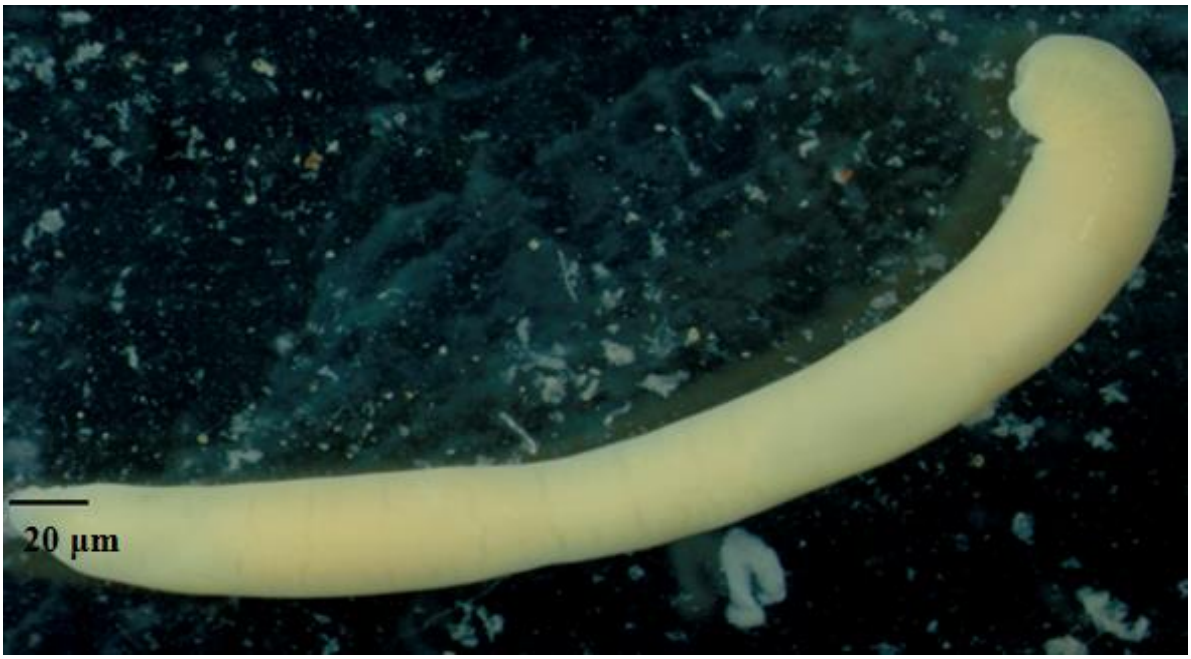

Figure 2. *Neoechinorhynchus rutili* (Scale: 100 µm-0,1mm)

N. rutili is an acanthocephalan worm. Their body is small and cylindrical. Their proboscis is short and there are 6 hook lines on the proboscis with 3 hooks on each. Their anterior hook is more elongated [16]. Parasites were found in the small intestines of fish. Hemorrhage was observed in areas where the parasites were widespread.

Figure 3. Plerocercoid of *Ligula intestinalis* (Scale: 100 µm-0,1mm)

Table 1. Distribution of parasites according to fish species

Fish species	Number of fish examined	Number of fish infested	Parasite species	Location	Number of parasites	Prevalence (%)
Cyprinus carpio	36	5	*Neoechinorhynchus rutili*	Intestine	4	13.88
			Ligula intestinalis	Intestine	2	
Alburnus sp,	60	18	*Neoechinorhynchus rutili*	Intestine	3	30
			Ligula intestinalis	Intestine	27	
Barbus rajanorum	449	118	*Neoechinorhynchus rutili*	Intestine	693	26.28
			Ligula intestinalis	Intestine	2	
Capoeta angorae	78	11	*Neoechinorhynchus rutili*	Intestine	22	14.10
			Ligula intestinalis	Intestine	1	
Capoeta barroisi	332	319	*Neoechinorhynchus rutili*	Intestine	13799	96.08
Luciobarbus pectoralis	150	15	*Neoechinorhynchus rutili*	Intestine	52	10
			Ligula intestinalis	Intestine	5	
Leuciscus cephalus	8	4	*Neoechinorhynchus rutili*	Intestine	2	50
			Ligula intestinalis	Intestine	2	
Total	1113	490			14614	

1113 fishes (44.02%) of 490 fishes infected with at least one parasite were detected. Prevalence of parasites in fish species; as of *Cyprinus carpio,* 13.88%, *Barbus rajanorum* 26.28%, *Alburnus sp.* 30%, *Capoeta angorae* 14.10%, *Capoeta barroisi* 96.08%, *Luciobarbus pectoralis* 10% and *Leuciscus cephalus* 50% was calculated (Fig.4). Parasites at that study together with the rates of detection as follows: as endoparasites *Neoechinorhynchus rutili*; 99.73%, *Ligula intestinalis*; 0.26%.

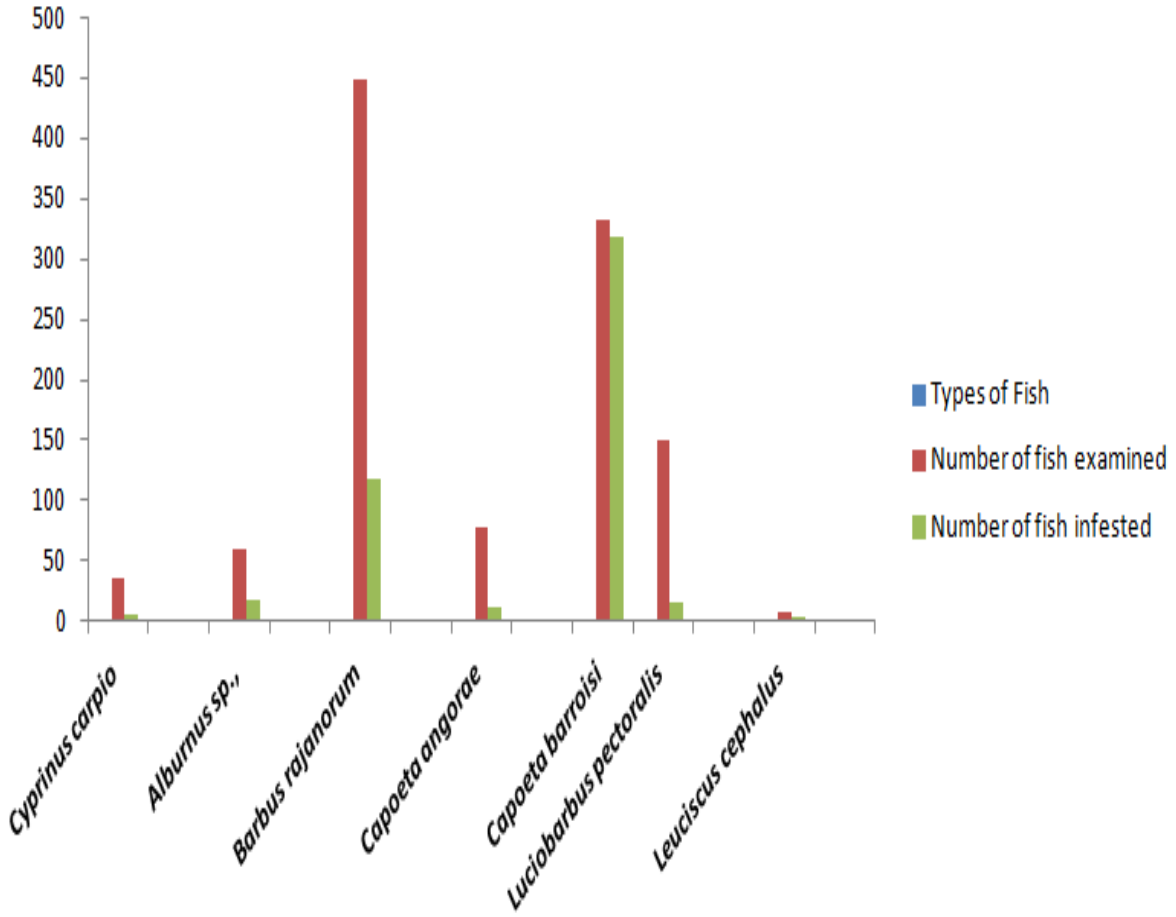

Figure 4. Prevalence (%) of parasites according to fish species

Prevalence, mean density and mean abundance rates tabulated separately for each parasite species (Table 2).

Table 2. Intensity, prevalence, and abundance of parasites in captured fish species

Fish species	Prevalence (%)		Mean density		Mean abundance	
	Neoechinorhynchus rutili	*Ligula intestinalis*	*Neoechinorhynchus rutili*	*Ligula intestinalis*	*Neoechinorhynchus rutili*	*Ligula intestinalis*
Cyprinus carpio	11,11	5,55	0,8	0,4	0,11	0,05

Alburnus sp,	5	45	0,166	1,5	0,05	0,45
Barbus rajanorum	154,34	0,44	5,872	0,016	1,54	0,004
Capoeta angorae	28,20	1,28	2	0,09	0,28	0,01
Capoeta barroisi	4156,32	0	43,25	0	41,56	0
Luciobarbus pectoralis	34,66	3,33	3,46	0,33	0,34	0,03
Leuciscus cephalus	25	25	0,5	0,5	0,25	0,25

4. Discussion and Conclusion

In this study, *Cyprinus carpio, Barbus rajanorum, Alburnus sp., Capoeta angorae, Capoeta barroisi, Leuciscus cephalus* and *Luciobarbus pectoralis* species caught in Menzelet Dam Lake in Kahramanmaraş were examined in terms of internal parasites and the locations of parasites, the amounts of infested fish and the number of parasites were calculated. The identification of *Neoechinorhynchus rutili* and *Ligula intestinalis* species found as a result of parasitological examination of fish was carried out according to Bykhouskaya – Poulovskaya [7], Hoffman [11], Kennedy [12] and Ekingen [13].

The fish studied in the study was found at least one parasite 44.02% (490/1113). *Leuciscus cephalus* was the highest infestation rate in 50% and *Luciobarbus pectoralis* was the least in 10%.

Unfortunately, the information on the spread of parasites in our country's fish, their life cycles and the economic losses caused by these is still not sufficient, although it was mentioned many years ago [14]. Massive deaths take place in acute parasitic diseases and declining growth in fish in chronic cases, and problems occur in marketing. In addition to this, the money spent on the treatment and the expenses of feeding the fish as a result of the fish not being able to benefit from the feed is making the situation worse.

Parasites need other living organisms in some or all of their lives in accordance with their biological evolution. They carry on their parasitic life cycles on top of or within these living organisms called hosts. They constantly affect the host's metabolism and vital functions during this life cycle. The parasites living in the digestive tract also disrupt the host's secretory function. All these effects lead to diseases and sometimes kill the host [15]. This study was conducted by taking into account that it is necessary to carry out a parasitological screening for fish species which are found in our region in order to prevent the parasitic diseases causing economic losses in fishing.

The presence of common parasites in these fish in the same environment has resulted in a more careful protective system in the aquaculture system.

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