

METAZOAN PARASITES OF TENCH (*Tinca tinca* L., 1758) IN THE LAKE SAPANCA, TURKEY

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ABSTRACT

In this study, metazoan parasites of tench (*Tinca tinca* L., 1758) in the Lake Sapanca were investigated between April 2005 and March 2006. A total of 57 tench were examined and 7 parasite species were recorded including; *Dactylogyrus macracanthus*, Wegener, 1909 (Monogenoidea) prevalence 26.3% mean intensity 9.06 ± 7.362, *Asymphyllodora tincae* (Modeer, 1970) 61.4%, 92.6 ± 84.107, *Diplostomum* sp. 12.3%, 2.3 ± 1.069 (Trematoda), *Caryophyllaeus laticeps* (Pallas, 1781) 8.7%, 7.2 ± 7.127 *Bothriocephalus acheilognathi* (Yamaguti, 1934) 3.5%, 4 ± 4.242 (Cestoidea), *Ergasilus sieboldi* Nordmann, 1832, 1.7%, 2 (Crustacea) and glochidia of mollusk 8.8%, 13.8 ± 12.421 (Bivalvia).

Key Words: Tench, metazoan parasites, Lake Sapanca.

ÖZET

SAPANCA GÖLÜ'NDEKİ KADİFE BALIĞI (*TINCA TINCA* L., 1758)'NİN METAZOAN PARAZİTLERİ

Bu çalışmada, 2005 Nisan ve 2006 Mart tarihleri arasında Sapanca Gölü'nde kadife balığı (*Tinca tinca* L., 1758) nın metazoan parazitleri araştırılmıştır. Toplam 57 adet kadife balığı ile çalışılmış ve aşağıdaki 7 parazit türü kaydedilmiştir; *Dactylogyrus macracanthus*, Wegener, 1909 (Monogenoidea) %26.3, ortalama yoğunluk 9.06 ± 7.362, *Asymphyllodora tincae* (Modeer, 1970) %61.4, 92.6 ± 84.107, *Diplostomum* sp. %12.3, 2.3 ± 1.069 (Trematoda), *Caryophyllaeus laticeps* (Pallas, 1781) %8.7, 7.2 ± 7.127 *Bothriocephalus acheilognathi* (Yamaguti, 1934) %3.5, 4 ± 4.242 (Cestoidea), *Ergasilus sieboldi* Nordmann, 1832, %1.7, 2 (Crustacea) ve mollusk glochidia'sı %8.8, 13.8 ± 12.421 (Bivalvia).

Anahtar Kelimeler: Kadife balığı, metazoan parazit, Sapanca Gölü.

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INTRODUCTION

Investigations on the parasite fauna of *T. tinca* in Turkey have been performed by (Burgu et al., 1988; Soylu, 1990, 2003; Aydoğdu et al., 1996; Öztürk, 2002; Yıldız, 2002; Ozan and Kır, 2005; Ergönül and Altındağ, 2005). In these studies follow mentioned parasites were recorded; *Ichthyophthirius multifiliis*, *D. macracanthus*, *Diplostomum spathaceum*, *Diplostomum* sp., *Asymphyllodora tincae*, *Piscicola geometra*, *Argulus foliaceus*, *Myxobolus* sp., *Dactylogyrus* sp., *Eustrongylides* sp., *Acanthocephalus lucii*, *Ergasilus sieboldi*, *Caryophyllaeus laticeps* *Bothriocephalus acheilognathi*, *Proteocephalus torulosus*, *Acanthocephalus anguillae*, *Ligula intestinalis* and mollusc glochidium. In the present study, prevalence, abundance and mean intensity of metazoan parasites of tench in Lake Sapanca were documented. Lake Sapanca is still in an oligotrophic state, but is slightly towards oligo-mesotrophy (Aykulu et al., 2006). Maximum depth of the lake is 52 m. there is no cold water fish species which are characteristic for oligotrophic lakes, but most of the fish species belongs to warmer water fish species which is typical to eutrophic lakes like cyprinidae, pike and perch. According to some studies in Lake Sapanca, the parasites of pike, roach and perch like *Henneguya psorospermica*, *Tetraonchus monenteron*, *Caryophyllaeus laticeps*, *Ligula intestinalis*, *Triaenophorus nodulosus* were recorded (Soylu, 1990; Uzunay and Soylu, 2006; Akmirza, 2007). All these parasite species may be regarded as characteristic of eutrophic waters. *Neoechinorhynchus rutilii* and *Argulus foliaceus* is found in both oligotrophic and eutrophic waters (Chubb, 1963). Both *N. rutilii* and *A. foliaceus* were also recorded in Lake Sapanca (Soylu, 1990). Investigation of metazoan parasites of *T. tinca* under this conditions will give us comparative data for study with other lakes in the region.

MATERIALS AND METHODS

Lake Sapanca is located between İzmit Bay and Sakarya River, has a surface area of about 46 km². Its maximum length width and depth are 16 km, 6 km and 54 m (with an average of 28.5 m) respectively (Worthmann et al., 1985; Soylu, 1986). In the summer a distinct thermocline forms between 9 and 15 m. Surface water temperature is 22-25 C and hypolimnetic temperature 7-10 C (Soylu, 1986).

The investigation was carried out between April 2005 and March 2006 with monthly periods. Fish specimens were taken from catches made by local fisherman. A total of 57 tench were examined immediately after sacrifice. Monogenoid parasites found on the host gill were removed using a needle. *Dactylogyrus* specimens were mounted in ammonium-picrate and determined freshly after pressing. Some permanent preparations were made in lacto-phenol or glycerin-alcohol.

Trematod and cestod specimens were determined alive or fixed in 70% alcohol. Parasites were stained in acetocarmine, most of these parasite specimens were slightly flattened before fixation. *Caryophyllaeus laticeps* was prepared as a whole mounts and certain parts of the strobilae of cestod specimens permanently mounted. Parasites were examined under a dissecting microscope (X40) and slides investigated with light microscope under oil immersion at (X100) magnification for monogenean parasite. The prevalence (%) was calculated as the proportion of infected individuals in the host samples. The mean intensity was calculated as the number of parasites divided by the number of infected hosts examined. The abundance was calculated as total parasites divided by number of fish sampled (average number of parasites per fish). The following

references were used for species determination; (Bykhovskaya-Pavlovskaya et al., 1962; Gussev, 1985; Markevic, 1951). Preparation of the slides was made according to (Bylund et al., 1980).

RESULTS AND DISCUSSION

Following the investigation of 57 tench, a total of 7 parasites species was found, including; *Dactylogyrus macracanthus* Wegener, 1909 Monogeneoidea, *Asymphylogora tincae* (Modeer),1970, *Diplostomum* sp Trematoda, *Caryophyllaeus laticeps* Pallas, (1781), *Bothriocephalus acheilognathi* (Yamaguti, 1934) Cestoda, *Ergasilus sieboldi* Nordmann, 1832 Crustacea, and glochidia of mollusk Bivalvia.

A. tincae was found from intestine of a total of 3240 specimens (61.4% prevalence and 92.6 ± 84.107 mean intensity) as the most common parasite species, maximum intensity of infection was observed in April and September. *A.tincae* was recorded all investigating periods but March, July and December. The second most common parasite was *D. macracanthus* and a total of 136 specimens was recorded (26.3%; 9.06 ± 7.362). This monogenean species was seen after water temperature reach to above 10 C, from May to September with two peaks in May and August. Abundance and mean intensity of the other recorded parasites were in low values, the results are summarized in (Table 1) and monthly distribution of the parasites showed in (Table 2). Monthly mean intensity values of the most common two parasite species *A. Tincae* and *D. macracanthus* were showed on Fig. 1.

Table 1. Infection prevalence, abundance and mean intensity of the parasites in *Tinca tinca* from Lake Sapanca (n=57)

Tablo 1. Sapanca Gölündeki *Tinca tinca* (kadife balığı) parazitlerinin enfeksiyon yayılımı, bolluğu ve ortalama yoğunluğu (n=57)

Parasites	Site of occurrence	Infected fish number	Prevalence	Total parasite number	Abundance	Mean intensity (min-max)
<i>D.macracanthus</i>	gill	15	26.3	136	2.38	9.06 (1-25)
<i>A.tincae</i>	intestine	35	61.4	3240	56.8	92.6 (16-423)
<i>Diplostomum</i> sp.	Eye	7	12.3	16	0.28	2.3 (1-4)
<i>C.laticeps</i>	intestine	5	8.7	36	0.63	7.2 (1-19)
<i>B.acheilognathi</i>	intestine	2	3.5	8	0.14	4 (1-7)
<i>E.sieboldi</i>	gill	1	1.7	2	0.03	2
Glochidium	gill	5	8.8	69	1.21	13.8 (2-34)

Table 2. Monthly distribution of the parasites of *Tinca tinca* from Lake Sapanca

Tablo 2. Sapanca Gölündeki *Tinca tinca* (kadife balığı) parazitlerinin aylık dağılımı

Parasites	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>D. macracanthus</i>	-	-	-	-	+	+	+	+	+	-	-	-
<i>A. tincae</i>	+	+	-	+	+	+	-	+	+	+	+	-
<i>Diplostomum</i> sp.	+	-	-	-	+	-	+	-	-	-	-	-
<i>C. laticeps</i>	-	-	-	+	+	-	-	-	-	-	+	-
<i>B. acheilognathi</i>	-	-	-	-	-	+	+	-	-	-	-	-
<i>E. sieboldi</i>	-	-	-	-	-	+	-	-	-	-	-	-
Glochidium	-	+	-	+	-	+	-	-	-	-	-	-

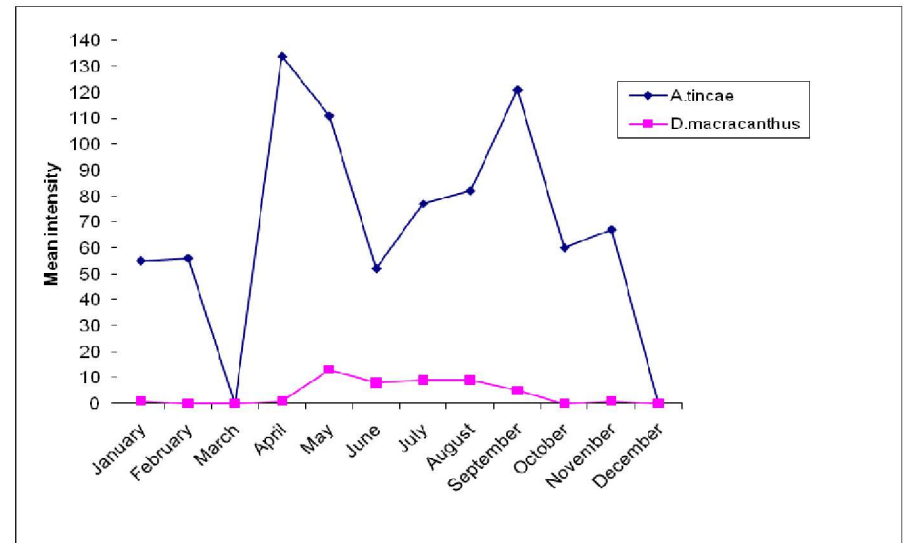


Figure 1. Monthly mean intensity of *Asyphylogora tincae* and *Dactylogyrus macracanthus*.

Şekil 1. *Asyphylogora tincae* and *Dactylogyrus macracanthus*'un aylık ortalama yoğunluğu.

Investigation on the parasites of *Tinca tinca* in Turkey was performed by some authors. Soylu (1990), found *Ichthyophthirius multifiliis*, *D. macracanthus*, *Diplostomum spathaceum*, *A. tincae*, *Piscicola geometra*, *Argulus foliaceus* and mollusc glochidium in tench from Lake Sapanca. Soylu (2003), recorded *D. macracanthus*, *A. Tincae*, *D. spathaceum*, *D. clavatum* and mollusc glochidium from Lake Durusu. Aydogdu et al., (1996) was recorded *Myxobolus* sp, *Dactylogyrus* sp, *A. Tincae*, *Eustrongylides* sp. from Lake Iznik. Öztürk (2002), was remarked *D. macracanthus*, *A. Tincae*, *Acanthocephalus*

lucii, *Ergasilus sieboldi*, *A. foliaceus*, *P. geometra* in *T. tinca* from Lake Uluabat. Both diversity and abundance of parasite different from one host population to the next. Certain habitat characteristics, either physical or chemical, may facilitate the establishment and proliferation of parasites in particular host population (Bagge et al., 2003). Findings of the parasites of *T. tinca* from different regions of Turkey agree with this suggestion. On the other hand present study has also similarities with the results of above mentioned investigations and *D. macracanthus*, *A. tincae*, *Caryophyllaeus laticeps*, *Bothriocephalus acheilognathi* are the most common parasites of tench recorded from different region of Turkey. Only Ozan et al., (2006), recorded *Proteocephalus torulosus* and *Acanthocephalus anguillae* from Lake Beyşehir, Kir and Ozan (2005), recorded *Proteocephalus torulosus* from Lake Kovada as different parasites species for *T. tinca*. Ozan and Kir (2005), Ergönül and Altındag (2005), found *Ligula intestinalis* in *T. tinca* from Lake Mogan.

In the present study it can be seen that *Asymhylodora tincae* and *Dactylogyrus macracanthus* are the core parasite species and very common throughout the year except a few months. These two parasite species of tench was recorded from all other region of Turkey. Among the parasites of *Tinca tinca*, only one monogenean species, *D. macracanthus* was recorded which host specific parasites for tench. *D. macracanthus* was found lower mean intensity value in Lake Sapanca, when monogeneans occur in small numbers their effect upon the host is little (Chapman et al., 2000). It may be suggested that *D. macracanthus* is not cause an epizootics in this environmental conditions of the lake. But abundance of *A. tincae* has negative influence on the host condition.

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