

## HELMINTHOLOGICAL INVESTIGATIONS OF FISH IN LAKE BALATON I. (PRELIMINARY REPORT) NEMATODES

FERENC MÉSZÁROS

*Zoological Department of the Hungarian Natural History Museum*

Director: Dr. Z. KASZAB

Received: 22nd February, 1967

The project of the complex biological study of Lake Balaton also provided for helminthological investigations in 1966. The present paper, submitting the elaboration of the collected nematode material, represents a general, informative report on the series of research studies planned for several years.

The first data with respect to the fish parasite fauna of Lake Balaton were given by RÁTZ (1897). He reported on the occurrence of *Camallanus lacustris*, by the name *Cucullanus elegans* ZEDER, in the intestine of *Perca fluviatilis*, *Lucioperca lucioperca*, *Esox lucius*, *Rutilus rutilus*, and *Acerina schraetzer*, as well as the species *Philometra sanguinea* (RUD., 1819), under the name *Ichthyonema sanguinea* RUD., from *Abramis brama*. MOLNÁR (1962) reported on two species from Lake Balaton, new for our fauna, namely *Camallanus truncatus* (RUD.) from *Lucioperca lucioperca* and *Aspius aspius*, and *Philometra rischta* SKRJABIN, 1917, from the gill flap and orbital cavity of *Alburnus alburnus*. In his recent papers, MOLNÁR (1966a, b) discussed the parasites, belonging to the genera *Philometra* and *Skrjabillanus*, of our home fish species; the same author (1966c) also studied, among others, the seasonal changes of *Camallanus lacustris* and *C. truncatus*.

### Material and methods

Originating from two points of Lake Balaton (the Tihany—Füred bay, Siófok), a total of 160 fish specimens, collected on three occasions, have been examined, namely: pike (*Esox lucius*), roach (*Rutilus rutilus*), balin (*Aspius aspius*), bleak (*Alburnus alburnus*), bream (*Abramis brama*), razor-fish (*Pelecus cultratus*), crucian-carp (*Carassius carassius*), carp (*Cyprinus carpio*), European wels (*Silurus glanis*), pike-perch (*Lucioperca lucioperca*), Volga pike-perch (*Lucioperca volgensis*), and perch (*Perca fluviatilis*).

The nematodes were fixed in Barbagallo solution, and cleared up by lactic acid for identification.

Identifications were based on MARKEVICH's (1951), BYKHOVSKY's (1962), and AGAPOVA's (1966) works.

## Results

Of the twelve investigated fish species, seven were found to harbour Nematode parasites. *Table 1* shows the rate of infection of the examined fish species.

*Table 1 — 1. Táblázat*  
Rate of infection of the fish species examined  
A fertőzöttség mértéke a vizsgált halaknál

Fish species — Halfajok	Number of examined specimens Vizsgált példányok száma	Number of parasitized specimens Fertőzött példányok száma	Percentage of extensity Extenzitás százaléka
<i>Abramis brama</i> .....	41	7	17
<i>Alburnus alburnus</i> .....	7	—	—
<i>Aspius aspius</i> .....	2	—	—
<i>Carassius carassius</i> .....	1	—	—
<i>Cyprinus carpio</i> .....	18	—	—
<i>Esox lucius</i> .....	14	8	57.1
<i>Lucioperca lucioperca</i> .....	14	14	100
<i>Lucioperca volgensis</i> .....	5	5	—
<i>Pelecus cultratus</i> .....	10	1	10
<i>Perca fluviatilis</i> .....	8	8	—
<i>Rutilus rutilus</i> .....	36	1	2.7
<i>Silurus glanis</i> .....	4	—	—
Total — Összesen .....	160	44	27,5

Six nematode species have been identified in the examined fish species. They are as follows: *Camallanus lacustris*, *C. truncatus*, *Raphidascaris acus*, *Philometra ovata*, *Capillaria* sp., *Contraecum* sp. larva.

The occurrence of the nematodes is given in *Table 2*.

*Table 2 — 2. Táblázat*  
Nematodes occurring in the fish species  
Nematodák előfordulása a halakban

Fish species	<i>Abramis brama</i>	<i>Esox lucius</i>	<i>Lucioperca lucioperca</i>	<i>Lucioperca volgensis</i>	<i>Pelecus cultratus</i>	<i>Perca fluviatilis</i>	<i>Rutilus rutilus</i>
<i>Camallanus lacustris</i> .....	+	+	+	+	+	+	
<i>Camallanus truncatus</i> .....	+	+				+	
<i>Raphidascaris acus</i> .....		+					
<i>Philometra ovata</i> .....	+						+
<i>Capillaria</i> sp. ....	+						
<i>Contraecum</i> sp. larva .....	+						

*Camallanus lacustris* (ZOEGER, 1776)Hosts: *Perca fluviatilis*, *Pelecus cultratus*

Localization: gaster, intestine

Length of males: 3—4.2 mm, length of females: 5.2—7.4 mm; width: 0.12—0.17 mm and 0.19—0.26 mm, respectively. Buccal capsule yellowish-brown, chitinous, 0.094—0.105 mm in males, and 0.10—0.142 mm in females, ribbed. Number of ribs is generally 25. Two sides of buccal capsule with a trident-shaped chitinous process each.

Length of median branch 0.06—0.07 mm in males, 0.10—0.12 mm in females. The trident-like chitinous process failing to reach half distance between buccal capsule and nerve ring. Esophagus consisting of a shorter, muscular (0.373—0.380 mm in males, 0.46—0.76 mm in females), and a longer, glandular (0.48—0.52 mm in males, 0.70—0.81 mm in females) section.

Caudal portion of males with narrow alae and 7 pairs of pre-, and 5 pairs of postcloacal, papillae. Measurements of the two different sized spicula 0.09—0.11 mm and 0.19—0.26 mm. Gubernaculum absent.

Vulva opening in middle (or slightly behind) of body. Viviparous. Length of larvae: 0.39—0.43 mm.

In the course of examinations, this species was found to occur together with *C. truncatus* in *Perca fluviatilis*. *C. lacustris* was found by MOLNÁR (1962) also in *Lucioperca volgensis* and *Acerina cernua*. The intensity of infection is 9—38 specimens per fish individual.

*Camallanus truncatus* (RUDOLPHI, 1814)

Hosts: *Abramis brama*, *Esox lucius*, *Lucioperca lucioperca*, *L. volgensis*, *Perca fluviatilis*. MOLNÁR (1962) found it also in *Aspius aspius*.

Localisation: gaster, intestine, pyloric appendages.

Similar to the preceding species, but differing in the branches of the trident-like process subtending a smaller angle with one another, the branches extending also beyond the half length of the distance between the buccal capsule and the nerve ring.

Length of males: 2.70—4.80 mm, length of females: 3.80—10.60 mm. Length of buccal capsule: 0.078—0.083 mm in males, 0.077—0.130 mm in females. Median branch of trident-shaped chitinous process 0.097—0.10 mm and 0.077—0.13 mm, respectively for the two sexes. Muscular portion of esophagus 0.48—0.52 mm and 0.58—0.62 mm, while glandular portion 0.45—0.58 mm and 0.62—0.82 mm, respectively for the two sexes.

The most commonly occurring nematode species in the examined fish species. The intensity of the infection is the highest in *Lucioperca volgensis*, the maximum being 41 nematodes in one fish exemplar; it is the smallest in *Esox lucius*, 1—6 nematodes per specimen.

*Raphidascaris acus* (BLOCH, 1779) RAILLIET et HENRY, 1915

Host: *Esox lucius*

Localisation: gaster

The length of the single examined specimen is 19.2 mm. Cuticle transversally ringed. A lateral wing behind lip, on anterior portion of body. Buccal aperture delimited by three lips (a dorsal and two latero-ventral ones). Esophagus 3.10 mm long, forming an appendix posteriorly, directed caudal. Caudal portion ventrally curved, with 17 pairs of pre- and 4 pairs of postanal papillae. Spicula uniform, 1.02 mm long.

As far as I know, the species has not yet been collected from a fish of Lake Balaton. In Hungary, it was first demonstrated by EDELÉNYI (1963) in *Esox lucius* and *Perca fluviatilis* originating from the Lake Fertő.

*Philometra ovata* (ZEDER, 1803)

Hosts: *Abramis brama*, *Rutilus rutilus*

Localisation: body cavity

MOLNÁR (1966 a) published a detailed description. The length of the specimens collected from *Abramis brama*, at the end of October, was 13.2—30.8 mm (females) and 2.2—2.3 mm (males). Intensity: 29—71 nematodes per fish specimen. Fishes surrendering *Philometra ovata* exemplars were infected by *Ligula*. There was a single exception: one *Philometra ovata* female (body length 16.8 mm) has been found in the body cavity of a *Rutilus rutilus*, captured on 24th October.

*Contracaecum* sp. larv.

Host: *Abramis brama*

Localisation: intestine

*Capillaria* sp.

Host: *Abramis brama*

Localisation: intestine

Of the two latter species, only a single individual was found each; I was unable to identify them as to species.

### Summary

In the course of examination of 160 fish specimens representing 12 species, 6 nematodes have been demonstrated. Of these, *Raphidascaris acus* has not yet been reported from Lake Balaton. The other species reported are: *Camallanus lacustris*, *C. truncatus*, *Philometra ovata*, *Contracaecum* sp. larv., *Capillaria* sp.

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A BALATONI HALAK HELMINTOLÓGIAI VIZSGÁLATA I  
(előzetes közlemény)  
nematodák

Mészáros Ferenc

Összefoglalás

12 fajhoz tartozó 160 hal vizsgálata során 6 Nematoda fajt állapítottam meg. Ezek közül a *Raphidascaris acus* fajt a Balatonból még nem írták le. További vizsgált fajok: *Camallanus lacustris*, *Camallanus truncatus*, *Philometra ovata*, *Contracaecum* sp. larv., *Capillaria* sp.

ГЕЛЬМИНТОЛОГИЧЕСКОЕ ИССЛЕДОВАНИЕ БАЛАТОНСКИХ РЫБ I  
(ПРЕДВАРИТЕЛЬНОЕ СООБЩЕНИЕ)

Ференц Месарош

В ходе исследования 160 экземпляров рыб, относящихся к 12 видам, было обнаружено 6 видов Nematoda. Из них *Raphidascaris acus* был найден впервые в Балатоне. Остальные выявленные виды: *Camallanus lacustris*, *Camallanus truncatus*, *Philometra ovata*, *Contracaecum* sp. larv., *Capillaria* sp.