



**PARASITE FAUNA OF *Chondrostoma nasus* (Linnaeus, 1758)
(TELEOSTEI: Cyprinidae) FROM LAKE OHRID (MACEDONIA)**

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SYNOPSIS

Key words:
parasite fauna,
nase,
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During the parasitological investigations on *Chondrostoma nasus* from Lake Ohrid (Macedonia), 6 parasite species were found: *Myxobolus exiguum*, *Paradiplozoon homoion homoion*, *Caryophyllaeus laticeps*, *Bothriocephalus opsariichthydis*, *Ligula intestinalis* (plerocercoid) and *Lamproglena pulchella*. The total prevalence of infestation is 70,83% and the highest prevalence is of *Paradiplozoon homoion homoion* (found in 50,0% of nases). The average intensity of infestation is 3,65, and the highest level is that of *Myxobolus exiguum* and *Paradiplozoon homoion homoion* (4,0). Findings of *Myxobolus exiguum*, *Bothriocephalus opsariichthydis* and *Lamproglena pulchella* represent first record for *Chondrostoma nasus* from Lake Ohrid. Among the parasite species found out in chub from the Lake Ohrid, the greatest pathological influence is associated with *Paradiplozoon homoion homoion*, *Caryophyllaeus laticeps*, *Bothriocephalus opsariichthydis*, *Ligula intestinalis* (plerocercoid) and *Lamproglena pulchella*.

INTRODUCTION

Lake Ohrid occupies the farthest southwestern part of Macedonia. The lake is more than 4 million years old, and it's the oldest lake in Europe. The lake is inhabited by 17 autochthonous species, of which 10 species (60%) are endemic (STOJANOVSKI, 2003).

Hristovski. (1983) found the following parasites in the fishes from the genus *Chondrostoma* in Macedonia *Caryophyllaeus laticeps*, *Ligula intestinalis* (plerocercoid) and *Contraecaecum* sp. in *Chondrostoma nasus* from Lake Ohrid; *Allocreadium markewitschi*, *Caryophyllaeus laticeps*, *Ligula intestinalis*

(plerocercoid) and *Contracaecum* sp. in *Chondrostoma prespense* from Lake Prespa; *Contracaecum* sp. and *Acanthocephalus anguillae* in *Chondrostoma vardarens*e from River Vardar;

Stojanovski (2003) found *Paradiplozoon homoion homoion* in *Chondrostoma nasus* from Lake Ohrid; and *Dactylogyrus elegans*, *D. vistulae* in *Chondrostoma prespense* from Lake Prespa;

Stojanovski et al. (2005) found *Paradiplozoon homoion homoion* in *Chondrostoma nasus* from Lake Ohrid.

MATERIALS AND METHODS

Fish material was sampled over three years (2006 - 2009), by seasons, from the Macedonian part of Lake Ohrid (Fig. 1) and river Crn Drim - outlet of the Lake Ohrid.



Figure 1: Lake Ohrid.

Photo: Stojanovski.

Only fresh fishes were subjected of routine identification, dissection and observation methods. Cleaned parasites were separated and put in certain fixatives, prepared for determination with determined techniques of staining and clearing (VASILJKOV, 1983; GUSSEV, 1983; STOJANOVSKI, 1997, 2003).

For identification of the parasite species we used the following keys: Lom & DYKOVA (1992) and BAUER (1985, 1987). The most successful preparations for every parasite species were photographed and are displayed.

RESULTS AND DISCUSSION

During the parasitological investigations on *Chondrostoma nasus* from Lake Ohrid and river Crn Drim (Macedonia), 6 parasite species: *Myxobolus exiguum* (Fig 2), *Paradiplozoon homoion homoion* (Fig 3-a,b), *Caryophyllaeus laticeps* (Fig 4-a,b), *Bothriocephalus opsariichthydis* (Fig 5-a,b), *Ligula intestinalis* (plerocercoid) (Fig 6) and *Lamproglena pulchella*. (Fig 7-a,b,c,d) were found.

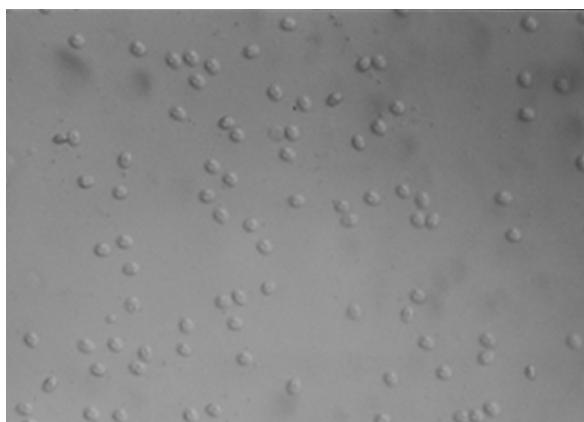


Figure 2:
***Myxobolus exiguum* x20**
(original).

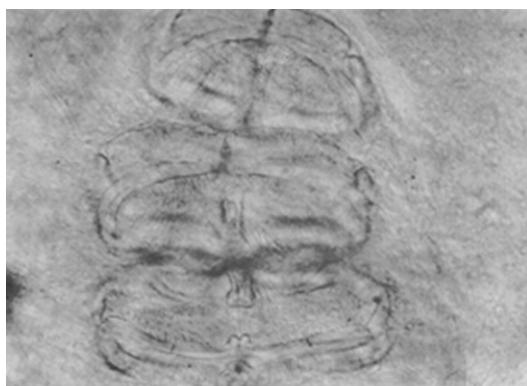


Figure 3-a: ***Paradiplozoon homoion homoion* - clamps, x 160 (original).**

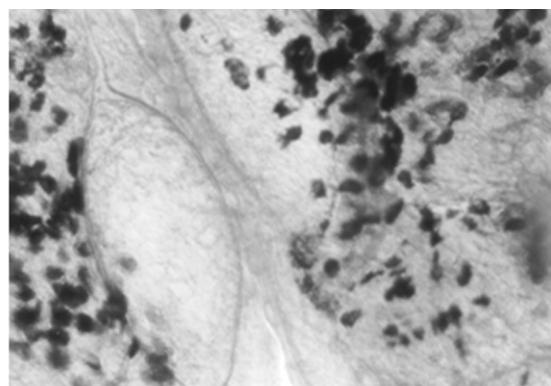


Figure 3-b: ***Paradiplozoon homoion homoion* - egg, x 100 (original).**

The total prevalence is 70,83%, i.e. 17 infested fishes of 24 examined. Prevalence with *Paradiplozoon homoion homoion* is the highest (50,0%), followed by *Ligula intestinalis* (plerocercoid) (12,50%), whereas the lowest prevalence of infestation was caused by *Myxobolus exiguum*, *Caryophyllaeus laticeps* and *Bothriocephalus opsariichthydis* (0,43%) (Table 1).

**Table 1. Prevalence and intensity of infestation in
Chondrostoma nasus from the Lake Ohrid.**

Parasite species	Prevalence			Intensity of infection	Season	Locality
	No. of examined fishes	No. of infected fishes	% of infected fishes			
<i>Myxobolus exiguus</i>	24	1	4.17	4.0	summer	Drim
<i>Paradiplozoon homoion homoion</i>		12	50.0	4.0	spring, summer	Pestani
<i>Bothriocephalus opsariichthydis</i>		1	4.17	1.0	summer	Pestani
<i>Caryophyllaeus laticeps</i>		1	4.17	1.0	summer	Pestani
<i>Ligula intestinalis</i> (plerocercoid)		3	12.50	1.67	summer	Pestani
<i>Lamproglena pulchella</i>		2	8.33	1.50	summer	Drim
Total infestation	24	17	70.83	3.65		

The average intensity of infestation is 3.65, and the highest level is that of *Myxobolus exiguus* and *Paradiplozoon homoion homoion* (4.0) and the lowest intensity of infestation was with *Caryophyllaeus laticeps* and *Bothriocephalus opsariichthydis* (1.0).

Among the parasite species, found out in Lake Ohrid, the greatest pathological influence is associated with: *Paradiplozoon homoion homoion*, *Caryophyllaeus laticeps*, *Bothriocephalus opsariichthydis*, *Ligula intestinalis* (plerocercoid) and *Lamproglena pulchella*.

The parasite fauna of *Chondrostoma nasus* from the Lake Ohrid and river Crn Drim is in common with that of the fishes of the family Cyprinidae from the Balkan Peninsula and more widely (ERGENS, 1960, 1970; ČANKOVIĆ et al., 1968; KAKAČEVA-AVRAMOVA, 1983; HRISTOVSKI, 1983; BAUER, 1985, 1987; DUPONT & LAMBERT, 1986 ; NEDEVA-LEBENOVA, 1991; CAKIĆ, 1992; STOJANOVSKI, 1997, 2003), etc.), with exception of *Caryophyllaeus laticeps*, which is found among other cyprinid fish.

The parasitofauna of *Chondrostoma nasus* from the Lake Ohrid is entirely freshwater.

All established parasites, more or less, are with wide area of distribution and wide specter of hosts.

Findings of *Myxobolus exiguum*, *Bothriocephalus opsariichthydis* and *Lamproglena pulchella* represent first record for *Chondrostoma nasus* from Lake Ohrid.



Figure 4-a: *Caryophyllaeus laticeps* - scolex (original).



Figure 4-b: *Caryophyllaeus laticeps* - posterior part (original).

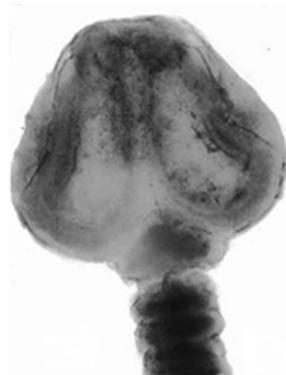


Figure 5-a: *Bothriocephalus opsariichthydis* - scolex (original).

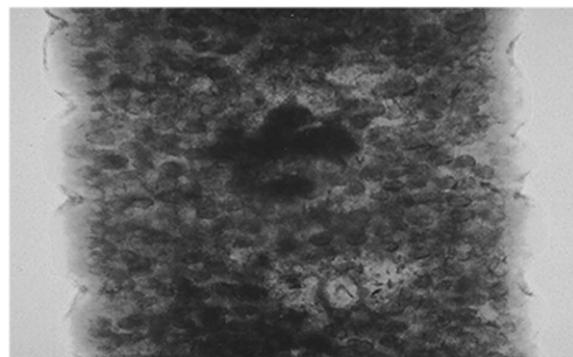


Figure 5-b: *Bothriocephalus opsariichthydis* - middle part (original).

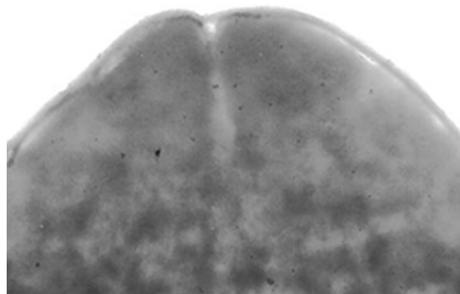


Figure 6:
Ligula intestinalis - anterior part of
plerocercoid (original).



Figure 7-a: *Lamproglena pulchella* - claw
(original electronic microphotography).



Figure 7-b: *Lamproglena pulchella* - whole
parasite (original electronic
microphotography).

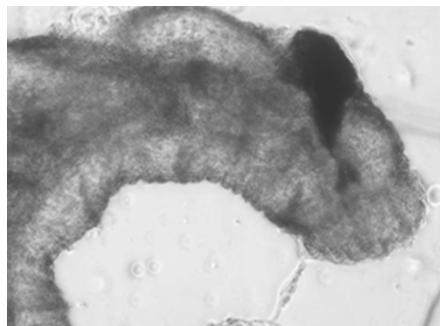


Figure 7-c: *Lamproglena pulchella* -
anterior part (original).



Figure 7-d: *Lamproglena pulchella* -
posterior part (original).

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