

TREMATODES OF THE EURASIAN COOT (*FULICA ATRA* L.) IN THE BELGRADE AREA

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A total of 118 Eurasian coots (*Fulica atra* L.) from the Belgrade area were examined and 68.64% were found to be infected with trematodes. Nine species of trematodes were detected: *Echinostoma sarcinum*, *Metorchis xanthosomus*, *Hyptiasmus oculaeus*, *Cyclocoelum mutabile*, *Cotylurus hebraicus*, *Notocotylus attenuatus*, *Notocotylus pacifera*, *Tanaisia longivitelata* and *Bilharziella polonica*.

These results showed the significant role of the Eurasian coot in the epizootiology of trematodosis in other birds, wild and domestic waterfowl, gallinacea and fish.

Key words: Eurasian coot, *Fulica atra* L., trematodes

INTRODUCTION

Studies conducted in the region of former Yugoslavia showed that in *Fulica atra* L. the following species of trematodes occurred: *Echinostoma sarcinum*, *Metorchis xanthosomus*, *Prosthogonimus ovatus*, *Cyclocoelum mutabile*, *Hyptiasmus brumpti*, *Hyptiasmus oculaeus* (Sey et al., 1971), *Cyclocoelum microstomum* (Shoti and Dimitrijević, 1974), *Echinostoma sarcinum*, *Metorchis xanthosomus*, *Cyclocoelum mutabile*, *Cyclocoelum microstomum*, *Leyogonimus polyoon*, *Prosthogonimus ovatus* (Shoti et al., 1976), *Patagifer bilobus*, *Echinochasmus belecephalus*, *Cotylurus hebraicus*, *Notocotylus attenuatus*, *Notocotylus linearis* (Brglez, 1977) and *Psilotrema spiculigerum* and *Psilotrema simillium* (Brglez and Hristovski, 1982).

Around the Belgrade area there are places where waterfowl live. The most numerous, widely distributed species of waterfowl in these areas are gulls (*Larus ridibundus* L.), wild ducks (*Anas platyrhynchos* L.) and the Eurasian coot-*Fulica atra* L. (Lepojev et al., 1990, Kulišić et al., 1991a, 1991b, 1992, Kulišić and Lepojev, 1994). Having this in mind, we decided to embark on a systematic examination of endoparasites of the coot, especially trematode species.

MATERIALS AND METHODS

A total of 118 Eurasian coots (*Fulica atra* L.) from the Belgrade area were examined. Out of the total, 58 Eurasian coots were caught at the location, Reva I,

and 60 at the location, Reva II. Both places are important natural habitats of waterfowl. Reva I is near the Danube and includes many flooded and swamp areas. Reva II is a swamp area in the vicinity of the river Tamish and includes many irrigation channels.

After necropsy, parasites were examined and collected by standard parasitological methods. Trematodes were identified in their native state or from preparations stained with acid carmine (Boch and Supperer, 1983).

RESULTS AND DISCUSSION

Among the 118 Eurasian coots (*Fulica atra* L.) examined, 81 were found to be infected with trematodes.

Nine species of trematodes were found: *Echinostoma sarcinum*, *Metorchis xanthosomus*, *Hyptiasmus oculeus*, *Cyclocoelum mutabile*, *Cotylurus hebraicus*, *Notocotylus attenuatus*, *Notocotylus pacifera*, *Tanaisia longivitelata* and *Bilharziella polonica* (Figures 1-9).

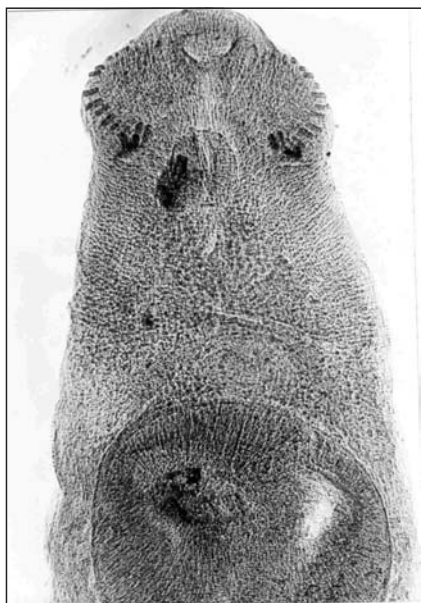


Figure 1. *Echinostoma sarcinum*

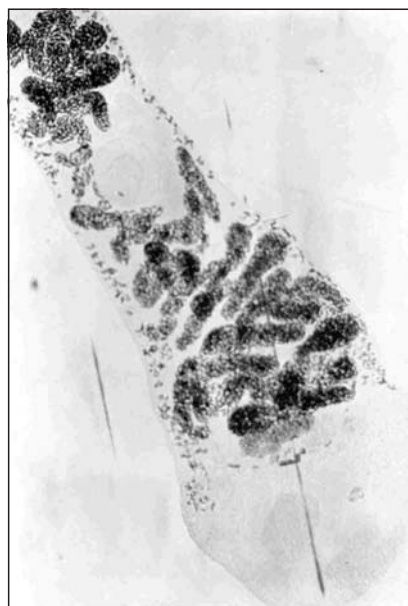


Figure 2. *Metorchis xanthosomus*



Figure 3. *Hyptiasmus oculius*

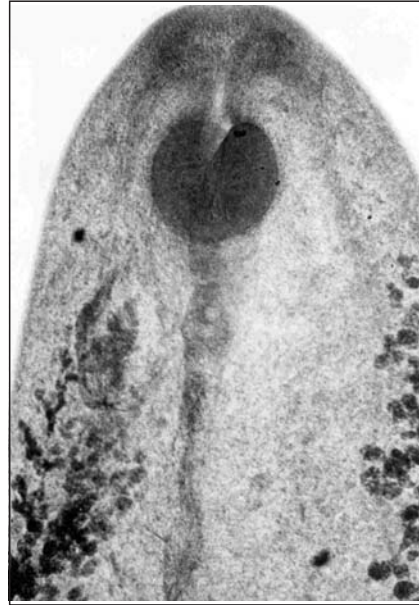


Figure 4. *Cyclocoelum mutabile*

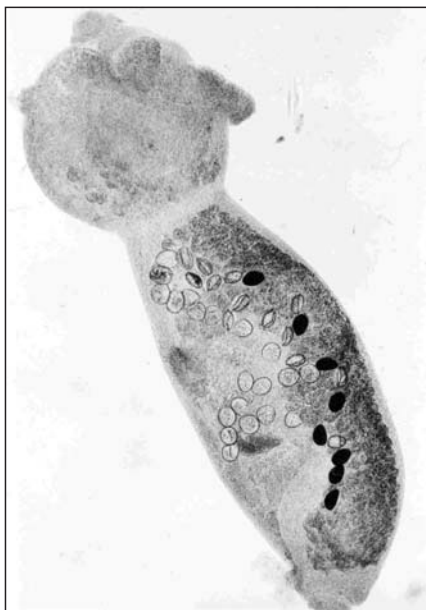


Figure 5. *Cotylurus hebraicus*

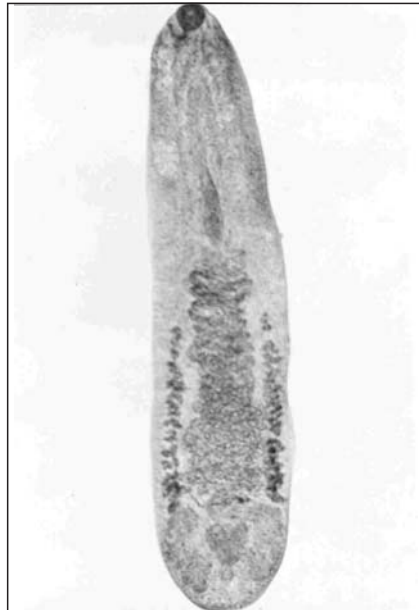


Figure 6. *Notocotylus attenuatus*



Figure 7. *Notocotylus pacifera*

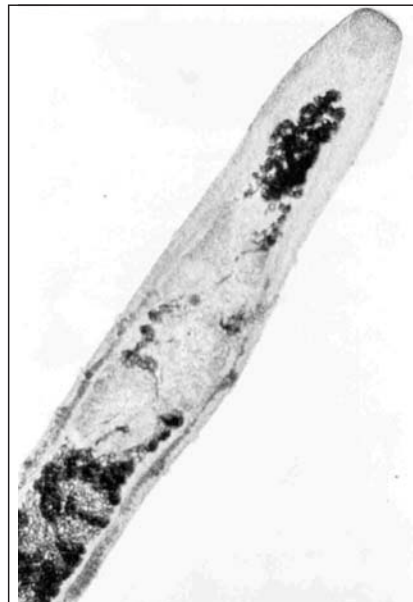


Figure 8. *Tanaisia longivitelata*

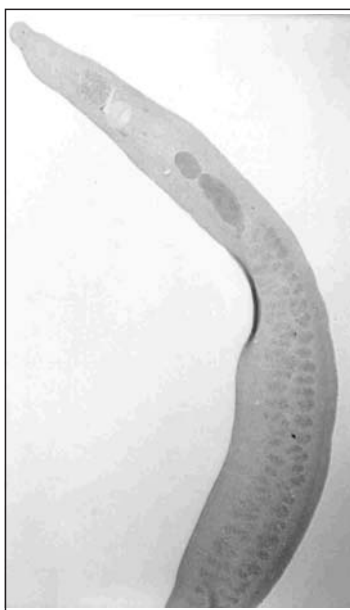


Figure 9. *Bilharziella polonica*

The largest number of infected Eurasian coots (42.37%) carried only one species of trematode, 21.19% carried two, and 5.08% were carriers of three species.

The organ sites of the trematode species were as follows:

The small intestine: *Echinostoma sarcinum* (Dietz, 1909), *Cotylurus hebraicus* (Dubois, 1934) and *Notocotylus pacifera* (Noble, 1933).

The caecum: *Notocotylus pacifera* (Noble, 1933), *Notocotylus attenuatus* (Rudolphi, 1809).

The liver: *Metorchis xanthosomus* (Creplin, 1846).

The respiratory system: *Cyclocoelum microstomum* (Zeder, 1800) Brands, 1892.

The kidneys: *Tanaisia longivitelata* (Strom, 1947).

The (head) sinuses: *Hyptiasmus oculcus* (Brandes, 1892) Kossack, 1911.

Species of *Bilharziella polonica* (Kowalewsky, 1895) were found in the blood vessels of the heart, intestines, liver, kidney and spleen.

The most widespread species of trematodes in *Fulica atra* L. were *Echinostoma sarcinum* and *Notocotylus pacifera*, identified in 44.92% and 33.05% of the birds, respectively, followed by *Notocotylus attenuatus* (22.88%), *Bilharziella polonica* (15.25%) and *Cotylurus hebraicus* (12.71%). The prevalence of infection with the other species of trematodes was at a much lower level (Table 1).

Table 1. Trematode species, number of infected Eurasian coots and intensity of infection

Trematode species	Examined Eurasian coots			Intensity of infection	
	Total	Positive		min	max
		No	%		
<i>Echinostoma sarcinum</i>	118	53	44.92	1	22
<i>Metorchis xanthosomus</i>	118	10	8.47	1	3
<i>Hyptiasmus oculcus</i>	118	11	9.32	1	3
<i>Cyclocoelum mutabile</i>	118	4	3.39	1	2
<i>Cotylurus hebraicus</i>	118	15	12.71	1	4
<i>Notocotylus attenuatus</i>	118	27	22.88	1	10
<i>Notocotylus pacifera</i>	118	39	33.05	1	14
<i>Tanaisia longivitelata</i>	118	7	5.93	1	5
<i>Bilharziella polonica</i>	118	18	15.25	1	4

The extent of infection with trematodes varied among the species and the areas from which the birds originated. Thus, infection with *Metorchis xanthosomus* and *Cyclocoelum mutabile* was not found at Reva I whereas *Hyptiasmus oculcus* was absent from Reva II. The prevalence of infection with *Echinostoma sarcinum* and *Notocotylus pacifera* in birds from Reva I was greater than on Reva II. Infection with other trematode species was at a similar level. The most abundant species in both localities were *Echinostoma sarcinum*, *Notocotylus attenuatus* and *Notocotylus pacifera* (Table 2).

The rate of infection depended on the age of the birds. Thus, young birds were infected with fewer trematode species and the rate of infection was lower, except in the cases of infection with *Cotylurus hebraicus* and *Hyptiasmus oculcus*. In young birds infection with six trematode species was found. Old birds were carriers of more trematode specimens and nine trematode species were found. Thus, the level of infection was higher, especially with *Echinostoma sarcinum*, *Notocotylus attenuatus*, *Notocotylus pacifera* and *Bilharziella polonica* (Table 3).

Table 2. Trematode species, number of infected Eurasian coots and the intensity of infection in different Belgrade areas

Trematode species	Location of REVA I						Location of REVA II					
	Examined Eurasian coots			Intensity of infection			Examined Eurasian coots			Intensity of infection		
	Positive		Total	min	max	Positive		Total	No.	%	min	max
	No.	%				No.	%					
<i>Echinostoma sarcinum</i>	58	30	51.72	1	22	60	23	38.33	2	19		
<i>Metorchis xanthosomus</i>	58	0	0.00	0	0	60	9	15.00	1	3		
<i>Hyptiasmus oculcus</i>	58	10	17.24	1	3	60	0	0.00	0	0		
<i>Cyclocoelum mutabile</i>	58	0	0.00	0	0	60	4	6.67	1	2		
<i>Cotylurus hebraicus</i>	58	7	12.07	1	3	60	8	13.33	1	4		
<i>Notocotylus attenuatus</i>	58	13	22.41	1	8	60	15	25.00	1	10		
<i>Notocotylus pacifera</i>	58	24	41.38	1	14	60	16	26.67	1	11		
<i>Tanaisia longivitelata</i>	58	2	3.45	2	4	60	5	8.33	1	5		
<i>Bilharziella polonica</i>	58	9	15.52	1	3	60	9	15.00	2	4		

Table 3. Influence of age range of Eurasian coots on the extent and the intensity of infection with trematode species

Trematode species	Young Eurasian coots						Old Eurasian coots								
	Examined Eurasian coots			Intensity of infection			Examined Eurasian coots			Intensity of infection					
	Positive		Total	min	max	Positive		Total	min	max	Positive				
	No.	%				No.	%				No.	%			
<i>Echinostoma sarcinum</i>	19	31.15	61	1	14	19	31.15	61	1	14	33	57.89	57	1	22
<i>Metorchis xanthosomus</i>	5	8.20	61	1	3	5	8.20	61	1	3	6	10.53	57	1	3
<i>Hyptiasmus oculcus</i>	6	9.84	61	1	3	6	9.84	61	1	3	4	7.02	57	1	3
<i>Cyclocoelum mutabile</i>	0	0.00	61	0	0	0	0.00	61	0	0	4	7.02	57	1	2
<i>Cotylurus hebraicus</i>	10	16.39	61	1	4	10	16.39	61	1	4	5	8.77	57	1	2
<i>Notocotylus attenuatus</i>	10	16.39	61	1	5	10	16.39	61	1	5	19	33.33	57	1	10
<i>Notocotylus pacifera</i>	13	21.31	61	1	10	13	21.31	61	1	10	26	45.61	57	1	14
<i>Tanaisia longivitelata</i>	0	0.00	61	0	0	0	0.00	61	0	0	7	12.28	57	1	5
<i>Bilharziella polonica</i>	0	0.00	61	0	0	0	0.00	61	0	0	17	29.82	57	1	4

The results of our examinations show that a great number of Eurasian coots originating from the vicinity of the Danube and Tamish are carriers of many trematodes. The species and the number of trematodes found indicate that in the Belgrade region there are conditions for the existence and spread of serious trematodosis in *Fulica atra* L. Thus, a great number of biotopes exist in which different species of fish, fresh-water snails and other species of intermediate hosts for trematodes find suitable conditions for development and survival. The living and eating habits of the Eurasian coot also enable completion of the life cycle of many species of trematodes and the existence of a permanent source of infection. This confirms the well known role of the Eurasian coot in the epizootiology of parasitic infection of other birds, fish and many molluscs (Sulgostovska and Korpaczewska, 1972, Mc Laughlin, 1977; Brooks and Palmieri, 1978; Mc Laughlin, 1986; Yatchenko, 1981, Pojmanska *et al.*, 1984; Branton *et al.*, 1985; Farias and Canaris, 1986; McKindsey and McLaughlin, 1994a, 1994b, 1995; Roderick *et al.*, 1998; Yoder and Coggins, 1998).

The results obtained show that the Eurasian coot can play a very important role in the epizootiology of trematodosis of wild waterfowl and gallinaceous birds, especially because they sometimes leave their own domicile and migrate. This is confirmed by the series of trematodes found in *Fulica atra* L. around Belgrade, which were also found in wild ducks (*Anas platyrhynchos* L), domestic waterfowl and *Gallinacea* in the same areas: *Metorchis xanthosomus*, *Notocotylus attenuatus* and *Bilharziella polonica*.

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TREMATODE LISKI (*FULICA ATRA* L.) NA PODRUČJU BEOGRADA

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SADRŽAJ

Od ukupno 118 pregledanih liski (*Fulica atra* L.) sa područja Beograda, 68,64% je bilo inficirano trematodama. Ustanovljeno je devet vrsta trematoda: *Echinostoma sarcinum*, *Metorchis xanthosomus*, *Hyptiasmus oculous*, *Cyclocoelium mutabile*, *Cotylurus hebraicus*, *Notocotylus attenuatus*, *Notocotylus pacifera*, *Tanaisia longivitelata* i *Bilharziella polonica*.

Ovi rezultati ukazuju na značajnu ulogu liski u epizootiologiji trematodoza drugih domaćih i divljih ptica, kokoši i riba.