ACTA ICHTHYOLOGICA ET PISCATORIA

Vol. III, Fasc. 2 1973

Marek SEYDA

Parasitology

PARASITES OF EEL *ANGUILLA ANGUILLA* (L.) FROM THE SZCZECIN FIRTH AND ADJACENT WATERS

PASOŻYTY WĘGORZA *ANGUILLA ANGUILLA* (L.) Z ZALEWU SZCZECIŃSKIEGO I WÓD PRZYLEGŁYCH

Institute of Ichthyology

Results of studies on the eel helminths from the Szczecin Firth are presented. 12 parasitic species were found, 4 of them being recorded for the first time in eel in Poland.

The eel helminths were repeatedly studied over the whole area of Poland. These were but occassional and sporadic studies additional either to investigating a parasitic fauna of the other fishes or to studying the development of another defined parasitic species.

The studies of this type were also carried on in the Pomeranian Lake District by **E. Grabda, J. Grabda** and **K. Wierzbicki** (1961). The Investigation area, however, covered only the north and northeast parts of the District, while its west part (the Western Pomerania) with the Dąbie Lake was surveyed only by **Kozikowska** (1957) who dealt exclusively with the parasitic copepods. Therefore I hope that my paper will contribute to a more comprehensive knowledge of the parasitic fauna of fishes from the Western Pomeranian waters, particularly from the Szczecin Firth and adjacent waters, and at the same time it will serve as a complement to the studies on the eel helminths.

Data concerning the eel parasites are collected in the Catalogue of the Parasitic Fauna in Poland, by **J. Grabda** (1971).

This work is realised in the scientific collaboration with Inland Fisheries Institute in Olsztyn.

Material

Total amount of 83 European eels, *Anguilla anguilla* (L.), with the body length (longitudo totalis) and weight ranges of 36.0–97.0 cm and 0.07–1.32 kg, respectively. was examined from May 19 th till October 28 th, 1971.

The material examined was collected from the following sampling sites' the West Odra River (the Stołczyn Fishing Base) gave 20 fishes amounting to 24.1%, the Dąbie Lake (the Dąbie Fishing Base) supplied 31 ones (37.1%) and the Szczecin Firth (the Trzebież Fishing Base) supplied 32 ones, i.e., 28,6% (Fig. 1).

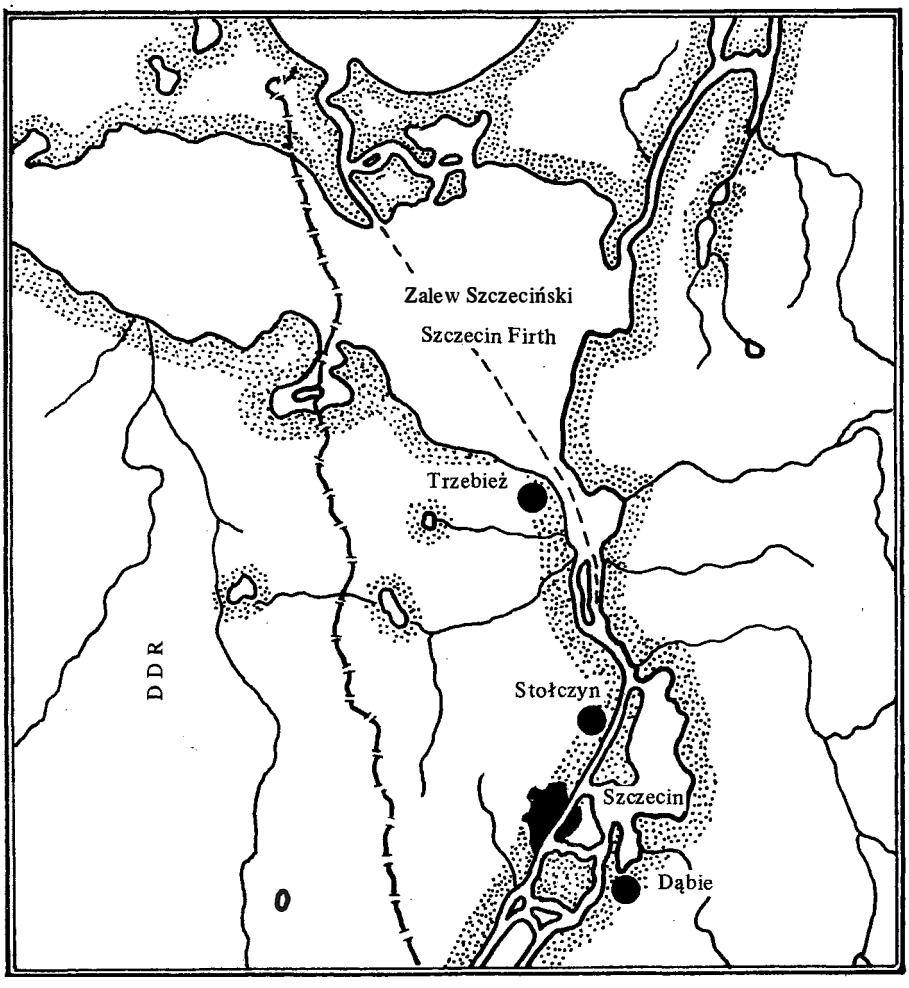


Fig. 1. Sampling sites

RESULTS

51 fish individuals out of the 83 examined were found to be parasitized; this indicated to a rather considerable mean invasion extensiveness of 61.4%. For each water body it

amounted to 64.5%, 55.0% and 62.5% in the Dąbie Lake, the Odra River and the Szczecin Firth, respectively.

In general, 12 parasitic species of various taxonomic groups were found as stated below:

CESTODA: 2 species of tapeworms were found in 28 fish individuals, resulting in 54.9% extensiveness of these parasites invasion.

1. *Bothriocephalus claviceps* Goeze; 106 individuals found.
2. *Proteocephalus macrocephalus* (Crepl.); 60 individuals found.

TREMATODA: 3 species of trematodes were found in 15 fish individuals, resulting in 29.4% extensiveness of these parasites invasion:

3. *Deropristis inflata* (Mol.); only 1 indivudal found.
4. *Diplostomum spathaceum* (Rud.); 20 individuals found.
5. *Tylodelphys clavata* (Nordm.); only 2 individuals found.

ACANTHOCEPHALA: 3 acanthocephalan species were found in 18 fish individuals, resulting in 35.3% invasion extensiveness.

6. *Pomphorhynchus laevis* (Zoega); 1 individual found.
7. *Acanthocephalus anguillae* (Müll.); 164 individuals found.
8. *Acanthocephalus lucii* (Müll.); 16 individuals found.

NEMATODA: 4 species of nematodes were found in 12 fish individuals, resulting in 23.5% extensiveness of these parasited invasion.

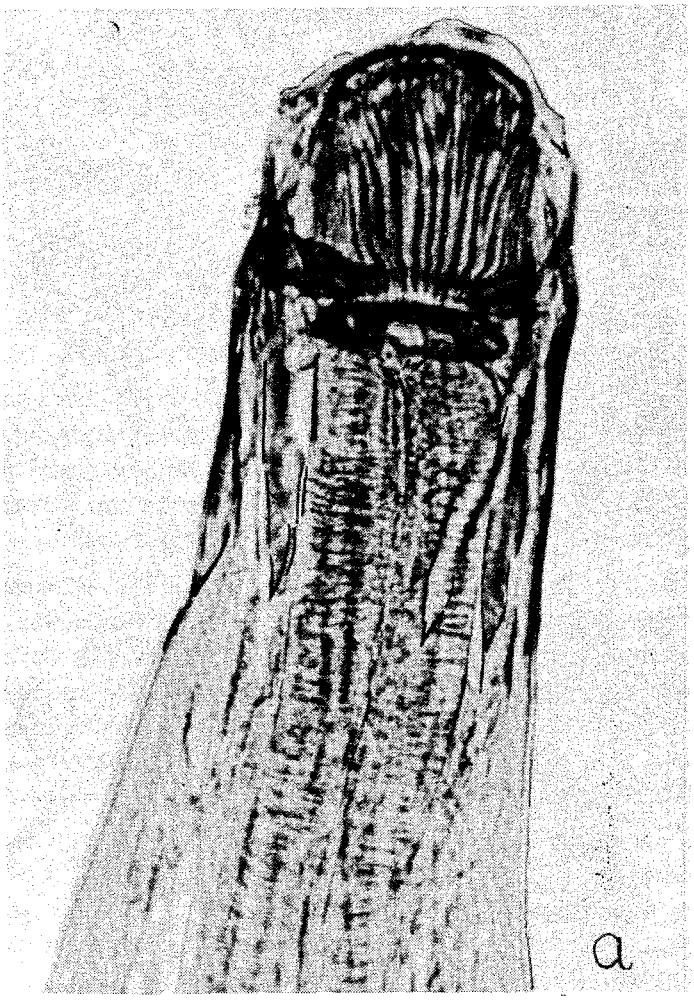
9. *Camallanus lacustris* (Zoega); 20 indyviduals found.
10. *Camallanus truncatus* (Rud.); only 1 indyvidual found.
11. *Raphidascaris acus* (Bloch); 20 individuals found.
12. *Eustrongylides excisus* (Jägerskiöld); 3 individuals found.

The two species of cestodes and the trematode *Deropristis inflata* appear to be the specific eel parasites. The rest of the parasites mentioned are recorded also in other freshwater fish species. The two species of cestodes and the acanthocephalan *Acanthocephalus anguillae* are encountered most commonly within the region investigated. The remaining species were found in rather small number of fish specimens.

The table shows the degree of eel infestation by parasites. The maximum intensity of invasion of parasites occurred in the largest fishes. A certain relationship between the number of parasites per one host and its size could even be stated. It was observed that the maximum numbers of 74 and 37 acanthocephalans occurred in the fishes of 900 and 570 g, respectively, 13 nematodes in a specimen of 1100 g, and the fishes of 850 and 1100 g harboured both 16 tapeworms. Such a large amount of parasites was never noted in small fishes of weight below 300 g.

My studies on eel did not incude the fish age analysis, but with the aid of the comparative table (age, weight, length) compiled by **Gąsowska** (1962) it could be found out that mainly o to 10 years old eels had been dealt with, the youngest specimens being at the age of 3–4.

The following parasites species were for the first time reported from eel in Poland:
TREMATODA
Diplostomum spathaceum (Rudolphi, 1819) Braun, 1893
Single larvae were found in eel in spite of their common occurrence in many fish species in the Szczecin Firth (**J. Grabda**, 1971).
Tylodelphys clavata (Nordmann, 1832) Diesing, 1850.
Metacercariae of this species occur in eel only occassinally. Single larvae were found while examining the eyes of two eels.
NEMATODA
Camallanus truncatus (Rudolphi, 1814)
This parasite is of uncommon occurrence in fish although its distribution range is rather wide-spread. So far in Poland *C. truncatus* have been reported from *Platichthys flesus* of



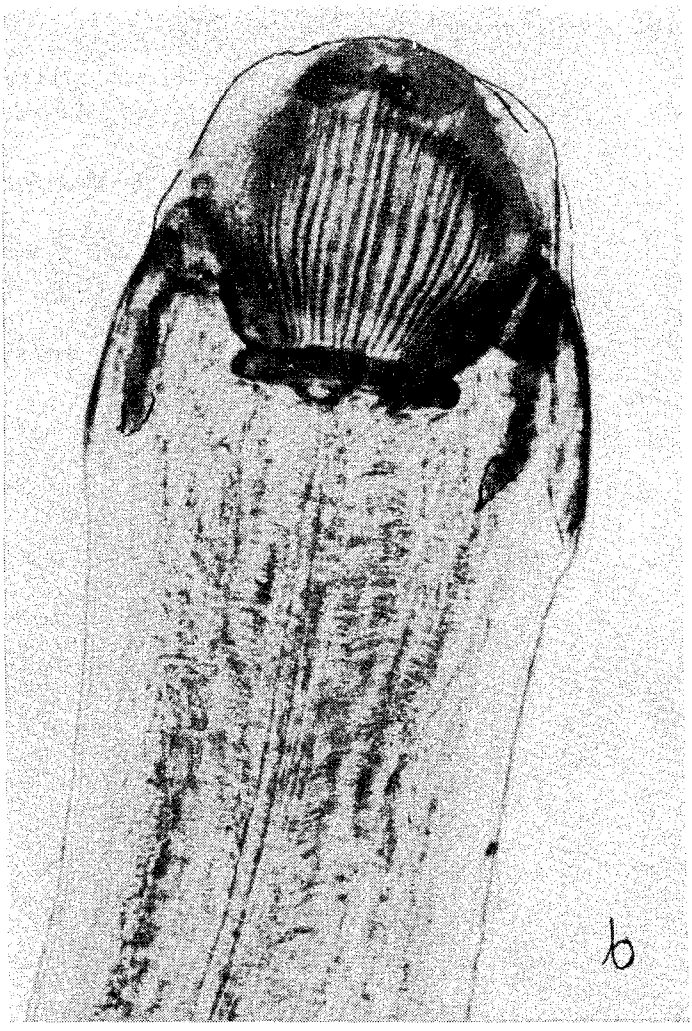


Fig. 2. a) Anterior part of *Camallanus truncatus* (Rud.)
b) Anterior part of *Camallanus lacustris* (Zoega)

the Kamień Firth (**Brucko – Stempkowski**, 1970), *Aspius aspius* of the Szczecin Firth (**Łukowski**, *1968*) *and Lucioperca lucioperca* (**Grabda**, personal communication). Only 1 specimen of this nematode was found in eel in spite of its rather common occurrence in the Szczecin Firth. The photographs showing the anterior body parts of the two *Camallanus* species are presented for comparison (Fig. 2). *Eustrongylides excisus* (Jägerskiöld, 1909)

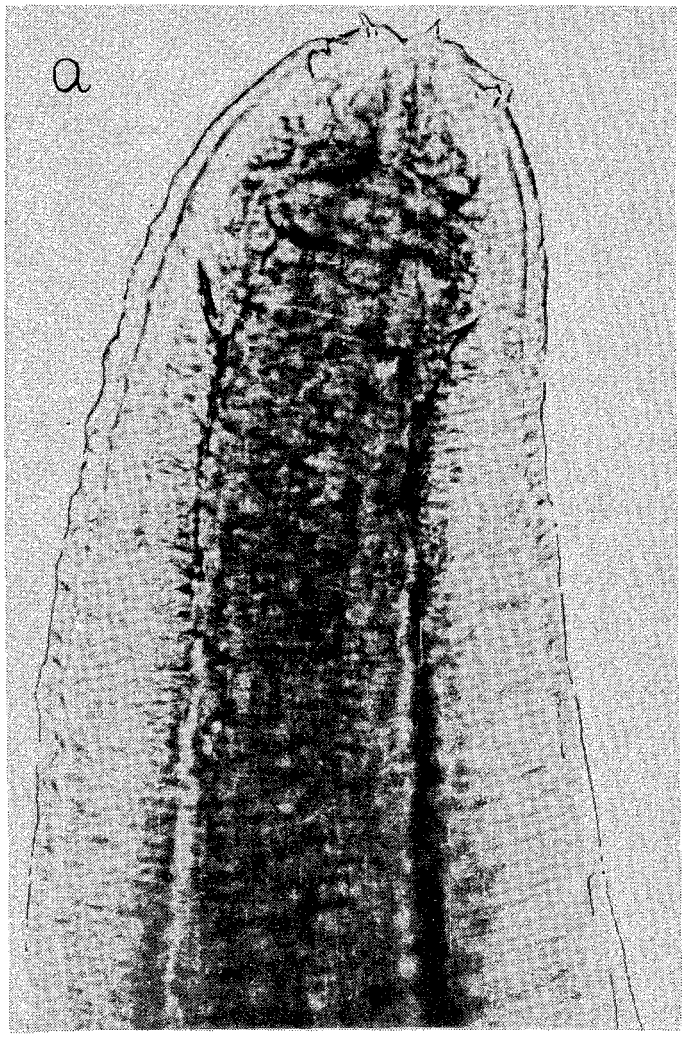
This species belonging to the family *Dictophymidae* Railliet, 1915 deserves a particular attention. It is a relatively rate parasite, for the first time recordend in eel. 3 encysted larvae of this parasite were found in the intestinal wall of one eel from Trzebież (Fig. 3).

So far in Poland this parasite has not been reported from fish. Only in 1961 **E. Grabda, J. Grabda** and **K. Wierzbicki,** when examining 36 individuals of *Acerina cernua* (L.) from the Wdzydze Lake, found one cyst in the intestinal wall of fish and made only its generic determination as *Eustrongylides sp.*

It is worthwhile to notice that *Acerina cernua* in which *Eustrongylides* has been observed for the first time often serves as food for eel.

In the USSR *Eustrongylides excisus* has been recorded from the intestinal walls of perch, pike-perch, sheatfish, "beluga", pike and sturgeon from the Caspian and Black Seas basins as well as from the Siberian rivers (**Izjumova** in **Byhovskij,** 1962).

Some aquatic birds like pelicans and cormorants (*Phalacrocorax carbo* and *P. pygmaeus)* are definite **hosts of this nematode.**



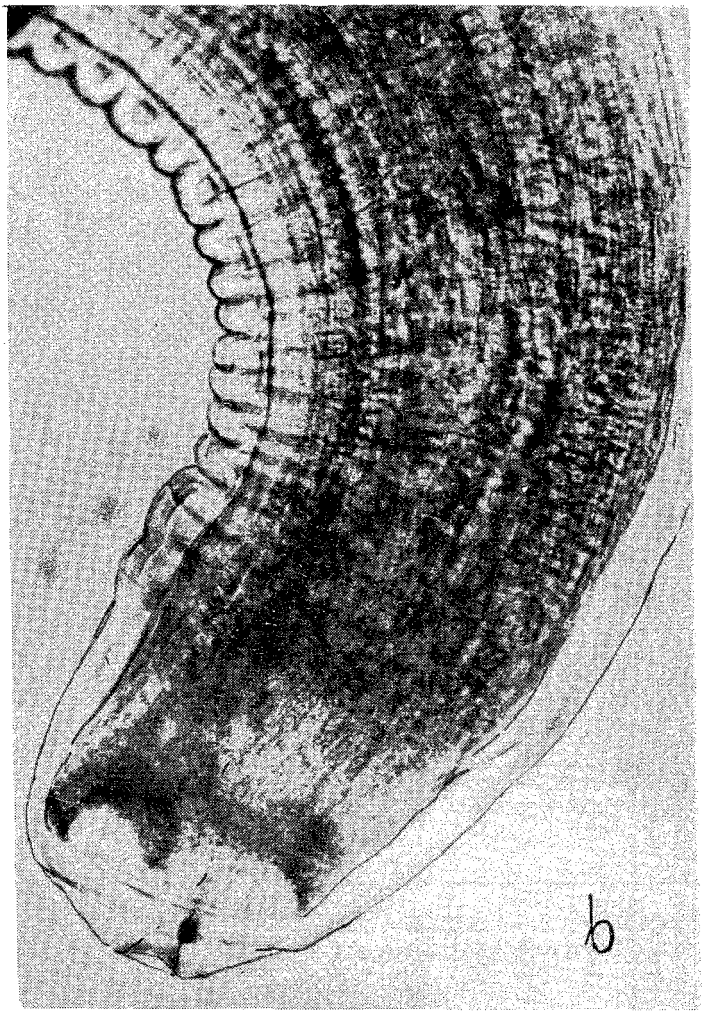


Fig. 3. Larva of *Eustrongylides excisus* (Jägerskiöld)
a) anterior part
b) posterior part

When discussing the eel parasites from the Szczecin Firth and adjacent waters, H. Engelbrecht' s work should be mentioned. He carried out his studies in the German part of the Szczecin Firth (the Little Firth) as well as on fishes from Greifswalder Bodden.

In 1958 the examined 734 fish individuals of 15 species including 145 specimens of eel. He found 9 species of parasites, and found out that 37% Greifswalder Bodden eel were infested while in the Little Firth the percentage of fish parasitized raised to 75%. The species number of the Greifswalder Bodden parasites was however higher than that of the Little Firth amounting to 7 and 4, respectively. The fact that Engelbrecht found only

Table 1

SPECIES OF PARASITES	Fishing Base-Stołczyn			Fishing Base-Trzebież			Fishing Base-Dąbie		
	Number of fish infected	Invasion intensity	Parasites number	Number of fish infected	Invasion intensity	Parasites number	Number of fish infected	Invasion intensity	Parasites number
Bothriocephalus claviceps Goese	5(25%)	1–11	21	12(37%)	1–14	59	7(23%)	2–13	26
Proteocephalus macrocephalus (Crepl.)	2(10%)	1–3	4	7(22%)	1–10	20	8(26%)	1–4	36
Deropristis inflata (Molin)	–	–	–	–	–	–	1(3%)	1	1
Diplostomum spathaceum (Rud.)	2(10%)	1	2	10(31%)	1–4	16	2(6%)	1	2
Tylodelphys clavata (Nordm.)	–	–	–	1(3%)	1	1	1(3%)	1	1
Camallanus lacustric (Zoega)	3(15%)	1–4	8	–	–	–	1(3%)	12	12
Camallanus truncatus (Rud.)	–	–	–	1(3%)	1	1	–	–	–
Raphidascaris acus (Bloch)	2(10%)	1–2	3	2(6%)	3–4	7	4(13%)	1–6	10
Eustrongylides excisus (Jägersk.)	–	–	–	1(3%)	3	3	–	–	–
Pomphorhynchus laevis (Zoega)	–	–	–	–	–	–	1(3%)	1	1
Acanthocephalus lucii (Müll.)	3(15%)	2–8	12	1(3%)	1	1	3(10%)	1	3
Acanthocephalus anguillae (Müll.)	7(35%)	1–37	64	–	–	–	9(29%)	1–74	100

4 parasitic species in the Little Firth, an integral part of the Szczecin Firth, seems to be only a question of chance in view of the results of the present researches indicating to the occurrence of all the species found by him in the Greifswalder Bodden, except Contraceum aduncum, over the whole area of the Firth.

REFERENCES

Bruck-Stempkowski R.: Parasites of the flounder-Platichthys flesus (L.) from the brackish water of Kamieński Bay. – Zeszyty Naukowe Nr 31 (Acta Ichthyologica et Piscatoria, 1) Szczecin,: 97–102.

Byhovskij B.E. (red), 1962: Opredelitel parazitov presnovodnyh ryb SSSR, Moskva-Leningrad, Izd. AN. SSSR.

Engelbrecht H., 1958: Untersuchungen über den Parasiten befall der Nutzfishe in Greiswalder Bodden und Kleinen Haff. – Z. Fischerei, 7, NF., 7/8: 481–511.

Gąsowska M. (red.), 1969: Klucz do oznaczania kręgowców Polski Część I-Krągłouste-Cyclostomi, Ryby-Pisces. [Key for identyfication of vertebrates of Poland. Part I.] PWN, Warszawa Kraków.

Grabda E., Grabda J., Wierzbicki K., 1961: Pasożyty i choroby ryb w jeziorze Wdzydze. [Parasites and fish diseases in Wdzydze Lake.] – Rocz. Nauk. Roln., D, 93: 239–266.

Grabda J., (red.), 1971: Katalog Fauny Pasożytniczej Polski Część II. Pasożyty Krągłoustych i Ryb. Catalogus faunae parasiticae Poloniae. Parasiti Cyclostomatorum et Piscium. PWN, Warszawa-Wrocław.

Kozikowska Z., 1957: Skorupiaki pasożytnicze (Crustacea parasitica) Polski, Część I. Pasożyty wód ujściowych Odry. [Parasitic Crustaceans (Crustacea parasitica) of Poland. Part I. Parasites in mouth of Odra River.] – Zool. Polon., 8, 2–3: 217–270.

Łukowski A.B., 1968: Parazytofauna bolenia z wód ujściowych Odry (maszynopis – Inst. Ichtiologii. [Parasitic fauna of Aspius aspius (L.) from mouth of Odra River (typescript-Institute of ichthyology)].

PASOŻYTY WĘGORZA *ANGUILLA ANGUILLA* (L.) Z ZALEWU SZCZECIŃSKIEGO I WÓD PRZYLEGŁYCH

Streszczenie

W okresie od maja do października 1971 roku prowadzono badania pasożytów węgorzy, pobieranych z trzech stanowisk (Baz Rybackich w Trzebieży, Dąbiu i Stołczynie). Łącznie przebadano 83 sztuki węgorzy, z których 51 a więc 61,4% było zarażonych pasożytami.

Największą ekstensywność zarażenia obserwowano u ryb ze stanowiska na jez. Dąbie, a najmniejszą u ryb z rzeki Odry (Stołczyn).

Znaleziono 12 gatunków pasożytów należących do czterech grup systematycznych takich jak: Tasiemce – *Cestoda,* Przywry – *Trematoda,* Kolcogłowy – *Acanthocephala* oraz Nicienie – *Nematoda.* Najliczniej reprezentowane były Kolcogłowy i Tasiemce.

Po raz pierwszy u węgorzy na terenie Polski rozpoznano następujące gatunki pasożytów:

TREMATODA: *Diplostomum spathaceum* (Rudolphi, 1819)
Tylodelphys clavata (Nordmann, 1832).

NEMATODA: *Camallanus truncatus* (Rudolphi, 1814)
Eustrongylides excisus (Jägerskiöld, 1909).

ПАРАЗИТЫ УГРЯ -ANGUILLA ANGUILLA (L.) В ЩЕЦИНСКОМ ЗАЛИВЕ И ПРИЛЕГАЮЩИХ ВОДАХ

Р е з ю м е

В период с мая по октябрь 1971 года проводились исследования паразитов угрей, которых вылавливали в трёх пунктах - рыбных базах в Тшебежи, Домбе и Столчыне. Всего было исследовано 83 угря, из которых 51, т.е.61,4%, были заражены паразитами.

Наибольшая экстенсивность заражения наблюдалась у рыб, выловленных из оз. Домбе, а наименьшая - у рыб из р. Одры (в Столчыне).

Было найдено 12 видов паразитов, принадлежащих к четырём систематическим группам: ленточные черви - Cestoda, трематоды - Trematoda, скребни - Acanthocephala и нематоды - Nematoda. Наиболее многочисленными были скребни и ленточные черви.

Впервые на территории Польши у угря обнаружены следующие виды паразитов:

TREMATODA: Diplostomum spthaceum (Rudolphi, 1819)

Tylodelphys clavata (Nordmann, 1832)

NEMATODA: Camallanus truncatus (Rudolphi, 1814)

Eustrongylides exicus (Jägerskiöld, 1909).

Received 15 VIII 1973 r.

Address:
Mgr Marek Seyda

Instytut Ichtiologii AR
71–550 Szczecin, ul. Kazimierza Królewicza 4
Polska – Poland