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Parasitology

PARASITE FAUNA OF THE TENCH, *TINCA TINCA* (L.) FROM
SELECTED LAKES OF THE NORTHWESTERN REGIONS OF POLAND

FAUNA PASOŻYTNICZA LINA *TINCA TINCA* (L.) Z WYBRANYCH
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In the tench collected from three lakes of the north-western region of Poland, namely: lake Insko, lake Mielno, and lake Woświn, a total of 20 parasite species was recorded. Representatives of the following species were commonly found: *Ichthyophthirius multifiliis*, *Dactylogyrus triappendix*, *Asymphyiodora tincae*, and *Ergasilus sieboldi* (the prevalence ranged from 34.37 to 65.62%). *Trypanosoma* sp., *Myxobolus ellipsoides*, *Trichodina* sp., *Trichodinella epizootica*, metacercariae of *Tylodelphys clavata*, and *Skrjabillanus tincae* were recorded relatively often (18.75–28.12%). The presence of *Thelohanellus pyriformis*, *Caryophyllaeus laticeps*, eggs of *Sanguinicola* sp., metacercariae of *Diplostomum* sp., and larvae of *Raphidascaris acus* (9.37% of infection) were recorded less frequently. The remaining parasites, namely: *Philometa ovata*, *Piscicola geometra*, *Acanthocephalus anguillae*, *A. lucii*, and *Argulus foliaceus* occurred as single specimens (3.12% of infection). Protozoans *T. epizootica* and nematodes *P. ovata* were recorded for the first time in the tench in Poland, whereas 18 species of parasites have not been noted yet in the north-western region of the country.

INTRODUCTION

Survey results of the parasite fauna of tench, *Tinca tinca* (L.) until 1970 have been described in detail in the "Catalogue of the parasitic fauna of Poland" edited by Grabda (1971). In this period 31 species of parasites belonging to the different taxonomic groups were found, ranging from Protozoa to Crustacea.

Within 1970–1995 a total of 38 species of parasites were recorded in this host in Poland. Most papers in this period dealt with faunistic questions, in which authors mentioned most often single or few species (Ejsymont 1970; Szreter 1974; Rokicki 1975; Niewiadomska 1977; Radkiewicz 1991, and others). The description of morphology of a individual parasites representing Protozoa is given by Kazubski and Mięgała (1974) and Jastrzębski (1981); Cestoda—by Kozicka (1971) and Adamczyk (1974); Trematoda—by Batur (1977) and Graczyk (1992); Nematoda—by Wierzbicka and Wierzbicki (1973). Some authors studied also the pathogenesis of parasites (Wierzbicka 1970a; Einszporn-Orecka 1973).

The majority of hitherto performed parasitological surveys of the tench concerned the central and northeastern Poland, however, from the northwestern regions of Poland only a single species parasitizing the tench was studied. It was a nematode *Skrjabillanus tincae*, found by Wierzbicka and Wierzbicki (1973) in fish from the Szczecin Lagoon and lake Dąbie.

The aim of the present paper was to study the parasite fauna of tench from the lakes of Western Pomerania, covering all taxonomic groups. The parasite fauna of this host from these areas has not yet been studied. Another aim of this work was to compare our own results with the data from literature dealing with the Polish waters.

MATERIAL AND METHODS

The fish examined, came from lakes Ińsko, Woświn, and Mielno, situated in the northwestern Poland, in the Szczecin Province. The material was collected within 14 May and 26 June 1996. After the capture alive fish were brought to the laboratory and paced in aquarium. A total of 32 fish were studied. Their total length ranged from 15.5 to 32.0 cm and their weight was within 45–790 g. Twenty-one fish from lake Ińsko, 6 from lake Woświn, and 5 from lake Mielno were examined.

Parasitological necropsies were performed on fresh fish, followed their anaesthetising with Propiscin. All specimens were examined in detail. The following organs were studied: the skin, fins, nostrils, mouth cavity, eyes, gills, muscle tissue, all internal organs, and blood.

The slides of protozoans were silvered with 1% silver nitrate solution (Klein's technique) or stained with the aid of the May-Grünwald and Giemsa method. Monogeneans found were preserved and cleared in lactophenol. The remaining parasites belonging to Metazoa were preserved in 75% ethanol. Nematoda and Acanthocephala were cleared in glycerine, whereas Copepoda—in lactic acid. The taxonomic position of some parasites was determined on the fresh material.

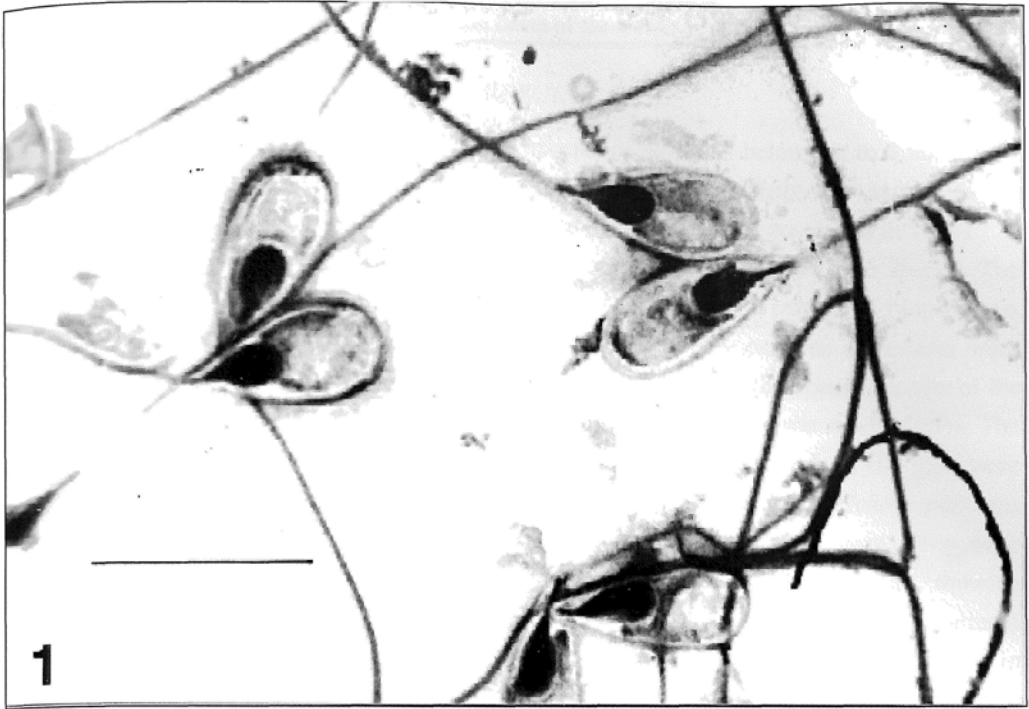


Fig. 1. Spores of *Thelohanelles pyriformis* (scale bar = 20 μm)*

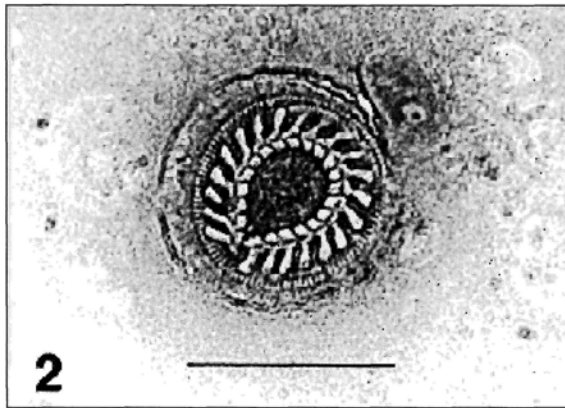


Fig. 2. *Trichodinella epizootica* (scale bar = 20 μm)*

RESULTS

In tench, *Tinca tinca* under study 20 species of parasites belonging to 8 taxonomic groups were recorded. The list of parasites in the systematic arrangement as well as detailed data describing the infection of fishes from the lakes studied are shown in Tab. 1.

Protozoa—the most numerous group of parasites was represented by 6 species. The flagellates *Trypanosoma* sp. occurred as single specimens in the peripheral blood of six fish from lake Ińsko. Single or rather numerous spores of *Myxobolus ellipsoides* were noted in the skin, gills, nasal cavities, liver, kidney, intestine, and the urinary bladder of the fish from lake Ińsko and Woświn. Overall prevalence with this parasite reached 25%. The sporozoans *Thelohanellus pyriformis* (Fig. 1) with plasmodia located on the gills were slightly less prevalent. Their number on one gill arch ranged from 1 to 12. *Ichthyophthirius multifiliis* were recorded often in the tench from lakes Ińsko and Woświn. They were found in the skin, fins, nasal cavities, mouth cavity, and the gills. In one fish, showing mass infection they were visible in macroscopic view as small, whitish tubercles scattered on the entire body surface. The next protozoan species, *Trichodina* sp., was observed in nine fish from 3 lakes investigated, as single or fairly numerous individuals on the gills and in the nasal cavities. However, these parasites were not found on the smears stained with the Klein's dry silver impregnation technique. Single specimens of ciliates *Trichodinella epizootica* (Fig. 2) were recorded on the gills of 6 tench from all the lakes studied.

On the gills of selected fish, only 1 species representing Monogenea—namely *Dactylogyrus triappedixis* was found. High infection of tench was observed in lakes Woświn and Mielno.

The only representative of Cestoda was *Caryophyllaeus laticeps*. Single cestodes belonging to this species were found in the intestine of four fish from lakes Ińsko and Woświn.

Asymphylodora tincae was the only representative of Trematoda found in the intestine of tench. This species is one of the most prevalent parasites of this host in the studied bodies of water, with the highest intensity of infection reaching 246 individuals. In the liver and kidney of three fish from lakes Woświn and Mielno not numerous, encysted eggs of *Sanguinicola* sp. were noted. Some single metacercariae of *Diplostomum* sp. parasitizing in the lens of eyes, were stated only in three tench from lake Ińsko. The higher infection of this host was reached by metacercariae of *Tylodelphys clavata*, located in the vitreous body of an eye. They were recorded in the material from three lakes.

Table 1

Infection of tench from the selected lakes of Western Pomerania

No.	Species of parasite		Lake Ińsko	Lake Woświn	Lake Mielno	Total
1	2	3	4	5	6	7
Protozoa						
1	<i>Trypanosoma</i> sp.	P	28.57	0	0	18.75
		I	+	0	0	+
2	<i>Myxobolus ellipsoides</i> Thélohan, 1892	P	28.57	33.33	0	25.0
		I	+ - ++	+	0	+ - ++
3	<i>Thelohanellus pyriformis</i> (Thélohan, 1892)	P	9.52	0	20.0	9.37
		I	+ - ++	0	+	+ - ++
4	<i>Ichthyophthirius multifiliis</i> Fouquet, 1876	P	57.14	33.33	0	43.75
		I	+ - +++	+	0	+ - +++
5	<i>Trichodina</i> sp.	P	23.81	50.0	20.0	28.12
		I	+	+	++	+ - ++
6	<i>Trichodinella epizootica</i> (Raabe, 1950)	P	14.28	16.67	40.0	18.75
		I	+	+	+	+
Metazoa						
Monogenea						
7	<i>Dactylogyrus triappendixis</i> Wierzbicka, Gronet, 1997	P	4.76	83.33	100.0	34.37
		I	6	2-50	5-15 ^x	2-50
		M	6.0	21.2 ^x	9.6 ^x	14.54 ^x
		A	0.28	17.67 ^x	9.6 ^x	5.0 ^x
Cestoda						
8	<i>Caryophyllaeus laticeps</i> (Pallas, 1781)	P	9.52	16.67	0	9.37
		I	1-5	1	0	1-5
		M	3.0	1.0	0	2.33
		A	0.28	0.17	0	0.22
Trematoda						
9	<i>Sanguinicola</i> sp., eggs	P	0	16.67	40.0	9.37
		I	0	+ - ++	++	+ - ++
10	<i>Asymphyrodora tincae</i> (Modeer, 1790)	P	61.9	83.33	60.0	65.62
		I	3-101	5-84	2-246	2-246
		M	32.15	21.8	95.33	38.71
		A	19.9	18.17	57.20	25.4
11	<i>Diplostomum</i> sp., met.	P	14.28	0	0	9.37
		I	1-5	0	0	1-5
		M	3.0	0	0	3.0
		A	0.43	0	0	0.28
12	<i>Tylodelphys clavata</i> (Nordmann, 1832), met.	P	14.28	50.0	60.0	28.12
		I	4-12	1	1-2	1-12
		M	9.0	1.0	1.67	3.89
		A	1.28	0.5	1.0	1.09

Table 1 (cont.)

1	2	3	4	5	6	7		
13	Nematoda <i>Skrjabillanus tincae</i> Šigin et Šigina, 1958	P	4.76	50.0	60.0	21.87		
		I	14	2-22	1-6	1-22		
		M	14.0	10.0	2.67	7.43		
		A	0.67	5.0	1.6	1.62		
		14	<i>Philometra ovata</i> (Zeder, 1803),	P	0	0	20.0	3.12
				I	0	0	1	1
				M	0	0	1.0	1.0
				A	0	0	0.2	0.03
		15	<i>Raphidascaris acus</i> (Bloch, 1779), 1.	P	0	33.33	20.0	9.37
				I	0	1-2	1	1-2
				M	0	1.5	1.0	1.33
				A	0	0.5	0.2	0.1
		16	Acanthocephala <i>Acanthocephalus anguillae</i> (Müller, 1780)	P	0	0	20.0	3.12
I	0			0	2	2		
M	0			0	2.0	2.0		
A	0			0	0.4	0.06		
17	<i>Acanthocephalus lucii</i> (Müller, 1776)			P	4.76	0	0	3.12
				I	1	0	0	1
				M	1.0	0	0	1.0
				A	0.05	0	0	0.03
18	Hirudinea <i>Piscicola geometra</i> (Linnaeus, 1758)	P	4.76	0	0	3.12		
		I	5	0	0	5		
		M	5.0	0	0	5.0		
		A	0.24	0	0	0.17		
19	Crustacea <i>Ergasilus sieboldi</i> Nordmann, 1832	P	19.05	100.0	100.0	46.87		
		I	1-35	4-143	3-105	1-143		
		M	14.25	59.0	31.2	37.8		
		A	2.71	59.0	31.2	17.72		
		20	<i>Argulus foliaceus</i> (Linnaeus, 1758)	P	0	16.67	0	3.12
				I	0	1	0	1
				M	0	1.0	0	1.0
				A	0	0.17	0	0.03

P—prevalence of infection [%];

I—intensity of infection;

M—mean intensity of infection;

A—abundance;

+ single specimens under coverslip (20×20 mm);

++ fairly numerous specimens (10-20 specimens under coverslip);

+++ over 40 individuals under coverslip;

*—data based on the surveys of two gill-arches.

Out of Nematoda only *Scrjabillanus tincae* was found fairly often in the tench; particularly in the fish from lakes Woświn and Mielno. The swim-bladder was the main site of their occurrence. The single individuals were found in the urinary bladder, as well. A total of 51 specimens of this species were recorded, including 4 males. One male of *Philometra ovata* was recorded in the swim-bladder of the tench from lake Mielno, whereas the single larvae of *Raphidascaris acus* were found in three fish from lakes Woświn and Mielno. They were located in the intestine and swim-bladder.

Acanthocephala were represented by two species parasitizing the intestine. Two females of *Acanthocephalus anguillae* were found in one tench from lake Mielno, while one female of *A. lucii* was noted in the material studied from lake Ińsko.

Representatives of Hirudinea—*Piscicola geometra* occurred scarcely on the skin of the tench from lake Ińsko.

Two species of parasites were assigned to Crustacea. One of them, *Ergasilus sieboldi*, inhabiting the gills, was the most frequently recorded parasite in the tench under survey. A very high infection was stated in lakes Woświn and Mielno. The fish from these areas were collected at the end of June. At that time all females of *E. sieboldi* had the entirely formed egg-sacs. A number of nauplii hatching from the eggs was observed. In the material studied only one specimen of *Argulus foliaceus* was recorded. It parasitized the skin of fish from lake Woświn.

DISCUSSION

The surveys conducted have shown that parasite fauna of the tench from three lakes of the Western Pomerania was very rich in species. In the fish studied a total of 20 specimens of parasites were found. This number exceeded the number reported in the literature, from the Polish territory. In the faunistic surveys of tench Niewiadomska (1977) recorded 4 species of parasites, while 6 species were found by Grabda et al. (1961), Baturo (1978), Pastuszko et al. (1984) and Grabda-Kazubska et al. (1987) and seven species—by Kozicka (1959). Only in lake Warniak Grabda-Kazubska et al. (1987) stated 9, whereas Groba (1973)—11 species of parasites.

The present study resulted in enrichment of the parasite fauna of tench in Poland by 3 species. Two of them—*Trichodinella epizootica* and *Philometra ovata* have not been hitherto recorded in this host, while *Dactylogyrus triappendixis* was described in a separate paper as a new species (Wierzbicka and Gronet 1997).

Asymphylogora tincae, *Ergasilus sieboldi*, *Ichthyophthirius multifiliis*, and *Dactylogyrus triappendixis* were the most frequently found in the material investigated. An overall prevalence of infection of these parasites ranged from 34.37 to 65.62%. A trematode *A. tincae* and a crustacean *E. sieboldi* were the common parasites of tench in the other

water bodies. Wierzbicka (1970 a, b) noted up to 100% infection with *A. tincae* with the intensity reaching 4000 specimens in one fish. A very high prevalence of the tench infection with *E. sieboldi* was recorded by Einszporn-Orecka (1973) and Grabda-Kazubaska et al. (1987). The protozoans *I. multifiliis* in this host have been found more rarely till now (Baturó 1978; Pastuszko et al. 1984).

Trypanosoma sp., *Myxobolus ellipsoides*, *Trichodina* sp., *Trichodinella epizootica*, *Tylodelphys clavata*, and *Skrjabillanus tincae* ranked among the relatively frequent parasites of the tench from lakes of the Western Pomerania. Their overall prevalence covered the range from 18.75 to 28.12%. Out of the above-mentioned parasites only in *T. clavata* and *S. tincae* the overall prevalence of tench in the material studied, was lower when compared to the data from the other areas of Poland (Grabda-Kazubaska et al. 1987). Also Wierzbicka and Wierzbicki (1973) found *S. tincae* in 50% of the fish examined. Sporozoans *M. ellipsoides* have so far been recorded only by Soltyńska (1967). The flagellates identified as *Trypanosoma tincae* were described only by Jastrzębski (1981). The ciliates from the genus *Trichodina* in tench from Polish waters were recorded by Groba (1973), Baturó (1978), and Pastuszko et al. (1984).

Less frequent parasites in the material analysed were: *Thelohanellus pyriformis*, *Caryophyllaeus laticeps*, *Sanguinicola* sp., *Diplostomum* sp., and *Raphidascaris acus*. Their overall prevalence amounted to 9.37%. In the literature concerning the other areas of Poland these parasites have been recorded rarely. Only Kozicka (1959) noted the numerous eggs and larvae of *S. armata* in 16–75% of tench in lake Drużno.

The remaining five species: *Philometra ovata*, *Piscicola geometra*, *Acanthocephalus anguillae*, *A. lucii*, and *Argulus foliaceus* occurred individually in the tench from lakes in the Western Pomerania. Similarly low infection of this host with the parasites discussed, from the other areas of Poland were reported by other authors. A slightly higher prevalence of the fish infection (22%) by acanthocephalan *A. anguillae* was recorded by Wysocka (1965), while that with *A. lucii*—by Grabda et al. (1961).

CONCLUSIONS

1. Parasite fauna of tench from lakes Ińsko, Woświn, and Mielno consisted of 20 species of parasites belonging to Protozoa (6 species), Monogenea (1), Cestoda (1), Trematoda (4), Nematoda (3), Acanthocephala (2), Hirudinea (1), and Crustacea (2).
2. Out of the parasites found as many as 18 species have not been noted in this host in the bodies of water of Western Pomerania.

3. The present survey enriched the parasite fauna of tench from the Polish territory by 3 species. *Trichodinella epizootica* and *Philometra ovata* were found for the first time in this host, whereas *Dactylogyrus triappendixis* was described as a new species (Wierzbicka and Gronet 1997).
4. Overall prevalence of individual parasites covered the range from 3.12 to 65.62%, while intensity of the infection in some cases reached mass levels.
5. The following parasites were the most frequently found in the material studied: *Ichthyophthirius multifiliis*, *Dactylogyrus triappendixis*, *Asymphylogora tincae*, and *Ergasilus sieboldi*.

REFERENCES

- Adamczyk L.H.**, 1974: Nowe i rzadkie w faunie Polski gatunki pasożytów ryb [New and rare species of fish parasites in Polish fauna]. Ann. Univ. Mariae Curie-Skłodowska Lublin-Polonia, Sectio C, **29**, 9: 107–117. (In Polish, English summary).
- Baturo B.**, 1977: *Bucephalus polymorphus* Baer, 1827 and *Rhipidocotyle illense* (Ziegler, 1883) (Trematoda, Bucephalidae): morphology and biology of developmental stages. Acta Parasitol. Pol., **24**, 20: 203–220.
- Baturo B.**, 1978: The comparison of the parasitofauna of tench fry (*Tinca tinca*) from pond and cage culture. Fourth International Congress of Parasitology 19–26 August 1978, Warsaw, section C: 200–201.
- Einszporn-Orecka T.**, 1973: Changes in the picture of peripheral blood of tench *Tinca tinca* (L.) under the influence of *Ergasilus sieboldi* Nordm. II. Changes in the leucocytic system. Acta Parasitol. Pol., **21**, 36: 485–499.
- Ejsymont L.**, 1970: Parasites of common burbot, *Lota lota lota* (L.), from the river Biebrza. Acta Parasitol. Pol., **17**, 22: 195–201.
- Grabda E., J. Grabda, K. Wierzbicki**, 1961: Pasożyty i choroby ryb w jeziorze Wdzydze [Parasites and fish diseases in Wdzydze lake]. Roczn. Nauk Roln., **93-D**: 239–266. (In Polish, English summary).
- Grabda J. (ed.)**, 1971: Katalog fauny pasożytniczej Polski. (Catalogus faunae parasiticae Poloniae). II. Pasożyty kręgloustych i ryb. (Parasiti cyclostomatorum et piscium). [Catalogue of parasite fauna of Poland. II. Parasites of fishes and cyclostomates]. PWN Warszawa-Wrocław: 61–68. (In Polish).
- Grabda-Kazubska B., B. Baturo-Warszawska, T. Pojmańska**, 1987: Dynamics of parasite infestation of fish in lakes Dgał Wielki and Warniak in connection with introduction of phytophagous species. Acta Parasitol. Pol., **32**, 1: 1–28.
- Graczyk T.**, 1992: Variability of metacercariae of *Diplostomum pseudospathaceum* Niewiadomska, 1984 (Trematoda, Diplostomidae). Acta Parasitol., **37**, 1: 5–9.
- Groba J.**, 1973: Experimentally increased fish stock in the pond type lake Warniak. V. Parasites of fish. Ekologia Polska, **21**, 31: 505–518.
- Jastrzębski M.**, 1981: Występowanie świdrowców z rodzaju *Trypanosoma* Gruby, 1841 we krwi karpia – *Cyprinus carpio* L. i lina – *Tinca tinca* L. [The occurrence of blood flagellates belonging to genus *Trypanosoma* Gruby, 1841, in the blood of carp—*Cyprinus carpio* L. and tench—*Tinca tinca* L.]. Wiad. Parazytol., **27**, 6: 753–761. (In Polish, English summary).
- Kazubski S.L., K. Migala**, 1974: Studies on the distinctness of *Chilodonella cyprini* (Moroff) and *Ch. hexasticha* (Kiernik) (Chlamyodontidae, Gymnostomatida), Ciliate parasites of fishes. Acta Protozool., **13**, 3: 9–40.

- Kozicka J.**, 1959: Parasitofauna of the biocoenosis of Drużno Lake. VIII. Parasites of fishes of Drużno Lake. *Acta Parasitol. Pol.*, 7, 1: 1–72.
- Kozicka J.**, 1971: Cestode larvae of the family Dilepididae Fuhrmann, 1907 parasitizing freshwater fish in Poland. *Acta Parasitol. Pol.*, 19, 6: 81–93.
- Niewiadomska K.**, 1977: Pasożyty wylegu i narybku niektórych gatunków ryb z jezior konińskich. [Parasites of hatchlings and of fry of some fish species from the Konin lakes complex]. *Rocz. Nauk Roln.* 97-H, 4: 45–59. (In Polish, English summary).
- Pastuszko J., M. Jastrzębski, M. Kłoczewska**, 1984: Rola chwastu *enianiu* inwazji pasożytniczych w karpiovych gospodarstwach stawowych. [The role of feral fishes in spreading of parasitic infection in breeding fishes]. *Wiad. Parazytol.*, 30, 2: 223–227. (In Polish, English summary).
- Radkiewicz J.**, 1991: Występowanie Hirudinea w jeziorach Nisko i Urad ze szczególnym uwzględnieniem pijawki rybiej *Piscicola geometra* (L.). [Occurrence of Hirudinea in Nisko and Urad lakes in special reference to *Piscicola geometra* (L.)]. *Wiad. Parazytol.*, 37, 2: 269–276. (In Polish, English summary).
- Rokicki J.**, 1975: Helminth fauna of fishes of the Gdańsk Bay (Baltic Sea). *Acta Parasitol. Pol.*, 23, 2: 37–84.
- Soltyńska M.**, 1967: Myxosporidia of fishes from the Zegrze Lake. *Acta Protozool.*, 4, 29: 307–325.
- Szreter H.**, 1974: Występowanie kolcogłowów (Acanthocephala) u ryb niektórych zbiorników wodnych Dolnego Śląska. [The occurrence of acanthocephalans (Acanthocephala) in fish of some water reservoirs of Lower Silesia]. *Wiad. Parazytol.*, 20, 4: 569–574. (In Polish, English summary).
- Wierzbicka J.**, 1970a: Zmiany spowodowane inwazją *Asymphylodora tincae* (Modeer, 1790) w jelicie lina (*Tinca tinca* (L.)). [Changes caused by invasion by *Asymphylodora tincae* (Modeer, 1790) in the intestines of tench *Tinca tinca* (L.)]. *Wiad. Parazytol.*, 16, 2: 169–173. (In Polish, English summary).
- Wierzbicka J.**, 1970b: Zagadnienie cykliczności w rozwoju *Asymphylodora tincae* (Modeer, 1790). [Problem of cyclic development of *Asymphylodora tincae* (Modeer, 1790)]. *Rocz. Nauk Roln.*, 92-H, 3: 85–92. (In Polish, English summary).
- Wierzbicka J., D. Gronet**, 1997: *Dactylogyrus triappendixis* sp. n. (Monogenea) parasite of the tench, *Tinca tinca* (L.). *Acta Ichth. Piscat.*, 27, 1: 75–82.
- Wierzbicka J., K. Wierzbicki**, 1973: The occurrence of nematodes of the genus *Skrjabillanus* Šigin et Šigina, 1958 (Nematoda, Skrjabillanidae) in Poland. *Acta Parasitol. Pol.*, 21, 16: 269–273.
- Wysocka B.**, 1965: Nematodes and acanthocephalans of fishes in the Zegrzyński reservoir. *Acta Parasitol. Pol.*, 13, 46: 499–506.

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PÓŁNOCNO-ZACHODNICH REJONÓW POLSKI

STRESZCZENIE

W badanych linach z jezior: Ińsko, Woświn i Mielno, położonych w północno-zachodnim rejonie Polski, znaleziono 20 gatunków pasożytów. Pospolicie występującymi były: *Ichthyophthirius multifiliis*, *Dactylogyrus triappendix*, *Asymphyrodora tincae* i *Ergasilus sieboldi* (ogólne zarażenie 34,37–65,62%). Do stosunkowo częstych należały: *Trypanosoma* sp., *Myxobolus ellipsoides*, *Trichodina* sp., *Trichodinella epizootica*, metacerkarie *Tylodelphys clavata* i *Skrjabillanus tincae* (18,75–28,12% zarażenia). Rzadziej stwierdzano obecność *Thelohanellus pyriformis*, *Caryophyllaeus laticeps*, jaja *Sanguinicola* sp., metacerkarie *Diplostomum* sp. i larwy *Raphidascaris acus* (9,37% zarażenia). Pozostałe pasożyty: *Philomerta ovata*, *Piscicola geometra*, *Acanthocephalus anguillae*, *A. lucii* i *Argulus foliaceus* występowały pojedynczo (3,12% zarażenia). Pierwotniaki *T. epizootica* i nicienie *P. ovata* stwierdzono po raz pierwszy u lina na terenie Polski, natomiast aż 18 gatunków pasożytów nie notowano w północno-zachodniej części kraju.

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