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Fish biology

**DIET OF SPINED LOACH, *COBITIS TAENIA* (L.) FROM ZEGRZYŃSKI
DAM RESERVOIR**

**POKARM KOZY, *COBITIS TAENIA* (L.) Z ZEGRZYŃSKIEGO
ZBIORNIKA ZAPOROWEGO**

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The paper presents the results of studies on spined loach - *Cobitis taenia* (L.) diet in Zegrzyński Dam Reservoir. Food composition of the fish collected at four stations was analysed and compared. The stations differed as to the environmental conditions. Changes of diet components in particular months were described for two sampling stations. Habitat conditions preferred by spined loach were described on the basis of the results and the literature data. A description was also given of its feeding grounds in the reservoir, and of the food of this fish in different places of its range of occurrence.

INTRODUCTION

Spined loach is found almost all over Eurasia, with the exception of Ireland, Scotland, Norway, Sweden (northward from 60° latitude). It is also absent in the rivers of Arctic Ocean basin (Berg 1949; Rolik 1960; Banarescu 1964).

Rare publications on the biology of spined loach refer to the stocks present in the former Soviet Union (Berg 1949; Nikolski 1956; Vashkevichjute 1959; Abdurakhmanov 1962; Shaposhnikova 1964; Popa 1976; Gani 1981), Great Ouse River in England (Robotham 1978, 1981) and north Italy (Marconato and Rasotto 1989).

In Poland spined loach inhabits waters with sandy or sandy-muddy bottom, with the exception of typically mountain streams. Food of this fish was studied in Wschodnia River (Skóra 1966), lakes in the vicinity of Węgorzewo (Leszczyński 1963), and lakes Legińskie and Dgał Wielki (Białokoz 1986).

The aim of the study was to determine food composition of spined loach in Zegrzyński Dam Reservoir.

MATERIAL AND METHODS

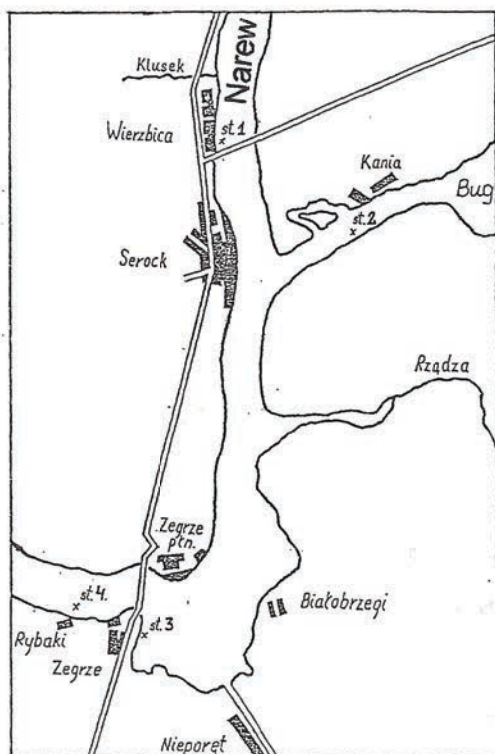


Fig. 1. Zegrzyński Dam Reservoir - situation and sampling stations 1-4

Zegrzyński Dam Reservoir is a typical lowland water body. It was constructed in 1963 as a result of damming the Narew River and construction of a power plant in Dębie. The reservoir area is about 33 km². It is 60 km long and from 0.5 to 3.0 km wide. The reservoir is essentially fed by two rivers: Bug (about 58%) and Narew (about 42%) (Kajak 1990).

In view of highly differentiated habitat of the reservoir, four sampling stations were selected. Two were located in the upper part, close to the inflow of Bug and Narew rivers. The third was located in the middle, still-water part, and the fourth one in the lower part (Fig 1.)

Characteristics of the sampling stations.

1. Wierzbica. At the right bank of the reservoir. This station was characterized by long, gently sloping littoral. Bottom with a thin layer of organic sediment, rather thickly overgrown with soft, submerged vegetation. Average depth 1.0 to 1.2 m.
2. Bug. Near the inflow of Bug River. Water was characterized by noticeable flow, about 20-25 m/s, and contained considerable amount of suspended solids. Its transparency did not exceed 0.5-1.0 m. Bottom loamy in upper part partly overgrown with soft, submerged vegetation. Average water depth 1.5 m.
3. Zegrze. At south reservoir shore, near the main part. Bottom sandy, or covered with sand and gravel, with islets of soft vegetation or filamentous algae. Average depth from 1.0 to 2.0 m.
4. Rybaki. At the left bank. Bottom covered with fine sand mixed with stones, in parts with a thin layer of sediment. No vegetation. Average depth 2.0 to 2.5 m.

Food tract contents of 323 fish were examined. The fish were caught since July till September 1986, since June till August 1987, Since May till September 1988, and in May 1989 (Tab. 1).

The results were presented as: numerical percentage, weight percentage, frequency of occurrence, and the index of relative importance (Szypuła 1979). In order to determine weight percentages of particular food components weight standards (Mordukhaj-Boltovskoj 1954; Starmach 1955) or own calculation were used. Food organisms were divided according to their numerical and weight percentages into: eudominant (50.1-100.0%), dominant (10.1-50.0%), subdominant (5.1-10.0%), rare (1.1-5.0%) and sporadic (< 1.0%). Due to insufficient sample size from the stations Bug and Rybaki, food composition was presented for all fish together, with no division into months.

RESULTS

Diet composition of spined loach from particular stations.

Station Wierzbica

Ostracoda represented the main food item throughout the whole period of the studies (with the exception of July 1986 and 1988). The represented from 55.5 to 86.0% of the weight and 21.9 to 60.0% of the numbers of food items. Amounts of *Ostracoda* increased in August and September each year. Index of their relative importance was higher than for other food items (Tab. 2).

Cladocera were also an important component of the diet of spined loach. They represented from 8.8 to 82% of the numbers of food items. Weight percentages were lower: from 3.2 to 29.1%. Most frequently found organisms belonged to *Chydoridae* family: *Alona* sp., *Leydigia* sp., *Chydorus* sp., *Pleuroxus* sp., *Eurycercus* sp. (Tab. 3).

Copepoda were the third important component, representing from 1.15 to 43.8% of numbers, and 0.2-8.04% of the weight of food components throughout the whole period of the studies (Fig. 2).

Chironomidae occurred in the diet of spined loach less frequently than the above mentioned organisms (Tab. 3). Weight percentages of these larvae amounted to from 3.15% to 40.7% in particular months. Most frequently these larvae belonged to the genera: *Procladius* sp., *Chironomus* sp., *Polypedilum* sp., *Glyptotendipes* sp., *Tanytarsus* sp.

At this sampling station nematodes were more frequently found in spined loach food than chironomid larvae. They were subdominants, representing from 1.0 to 27.1% of the numbers of food organisms. However, as regards the weight, these organisms were classified as rare (Fig. 2).

Table 1

Characteristics of the collected material
(l.c. - body length in mm, n - number of food tract, % - number of empty food tract in %)

Date	Wierzbica			Zegrze			Bug			Rybaki		
	Range of l.c.	n	%	Range of l.c.	n	%	Range of l.c.	n	%	Range of l.c.	n	%
1986												
VII	43.6-84.8	12	16.7				73.6-74.2	2				
VIII	62.6-74.4	7	14.3	30.0-96.0	25	16.0						
IX	39.1-66.0	4	100.0									
1987												
VI	35.0-71.0	14	50.0	65.4-81.0	6	66.7	60.0-87.7	4	50.0	47.0-101.3	7	57.1
VII	39.0-70.0	23	13.0	49.0-98.0	12	25.0						
VIII	43.0-64.0	12	8.3				35.5-92.0	4	100.0			
1988												
V	40.4-79.6	28	42.8	57.0-99.0	6	50.0	76.0-93.3	9	44.4	53.0-89.4	7	57.1
VI	48.0-73.0	14		61.5-91.4	10	20.0						
VII	49.0-75.0	12	8.3	48.0-93.2	14	21.4	27.0-103.4	7		53.0-85.5	7	
VIII	50.8-74.0	12		65.0-99.0	16	56.3				64.5-78.0	4	25.0
IX	43.5-78.5	34	44.1									
1989												
V										77.8-94.4	11	63.6
Total		172			89			26			36	

Table 2

Relative importance of main food items in the diet of spined loach from four station

Station	Year Month	<i>Cladocera</i>	<i>Copepoda</i>	<i>Ostracoda</i>	<i>Chironomi- dae</i>	<i>Nematoda</i>
Wierzbica	1986					
	VII	2 804	5 184	4 347	1 678	453
	VIII	1 198	44	9 388	450	2 467
	1987					
	VI	5 812	547	10 130	2 276	308
	VII	1 695	2 056	9 504	2 262	450
	VIII	11 072	-	5 832	819	-
	1988					
	V	6 927	2 367	8 528	758	214
	VI	5 936	184	10 487	1 544	-
	VII	4 991	-	9 640	3 470	482
	VIII	5 512	69	13 074	221	408
	IX	5 243	-	9 948	17	22
Zegrze	1986					
	VIII	11 097	319	5 736	670	-
	1987					
	VI	17 095	970	828	1 107	-
	VII	4 546	4 250	3 890	4 076	476
	1988					
	V	7 215	4 000	5 810	769	222
	VI	9 562	185	245	7 640	2 016
Bug	VII	8 616	4 310	622	3 720	536
	VIII	15 802	2 536	212	488	20
	1986					
	VII					
Bug	1987					
	VI	4 970	1 304	6 415	1 903	39
	1988					
Rybaki	V, VIII					
	1987					
	VI					
	1988					
Rybaki	V, VI, VII	14 738	684	471	1 820	16
	1989					
	V					

Oligochaeta were found in 66% of the fish. They were determined on the basis of bristles. Considerable amounts of detritus were found in two thirds of the food tracts, and 65% of the fish consumed periphyton. In July 1987 60% of the fish from this station had their food tracts filled with rotifers (Tab. 3).

Table 3

Frequency of occurrence (%) of more important items in spined loach food tracts
from Wierzbica station

Year	1986		1987			1988				
Month	VII	VIII	VI	VII	VIII	V	VI	VII	VIII	IX
Number of full tracts	10	6	7	20	11	16	14	11	12	19
<i>Alona</i> sp.	80.0		100.0	75.0	100.0	100.0	92.9	55.6	100.0	63.2
<i>Leydigia</i> sp.	10.0	100.0		30.0		64.3	50.0	44.4	58.3	52.6
<i>Chydorus</i> sp.			100.0			42.9			16.7	
<i>Eurycercus</i> sp.					18.2		35.7	9.1	8.3	
<i>Pleuroxus</i> sp.					100.0		35.7	9.1		
<i>Cladocera</i>	80.0	100.0	100.0	80.0	100.0	100.0	92.9	66.7	100.0	100.0
<i>Copepoda</i>	100.0	33.3	57.1	80.0		100.0	42.9		41.7	
<i>Ostracoda</i>	70.0	66.7	100.0	90.0	81.8	100.0	100.0	100.0	100.0	68.4
<i>Procladius</i> sp.	10.0	16.7		45.0	18.2	12.5	21.4	9.1	8.3	
<i>Chironomus</i> sp.	20.0		28.6	20.0		18.8	28.6	9.1	25.0	
<i>Polypedilum</i> sp.	30.0		57.1	25.0		6.3	21.4	27.3		
<i>Glyptotendipes</i> sp.		33.3		5.0				18.2	8.3	
<i>Tanytarsus</i> sp.			57.1		27.3	12.5		9.1		21.0
<i>Cricotopus</i> sp.		16.7		5.0	18.2	12.5				
<i>Chironomidae</i> l.	40.0	50.0	85.7	60.0	45.5	64.3	57.1	77.8	50.0	21.0
<i>Oligochaeta</i>	10.0	100.0	57.1	100.0	100.0	64.3		66.7	100.0	84.2
<i>Nematoda</i>	50.0	66.7	57.1	45.0		21.4		22.2	50.0	15.8
Detritus	100.0	100.0	100.0	50.0		14.3		77.8	100.0	100.0
Periphyton			100.0	75.0	100.0	78.6		100.0	100.0	73.7

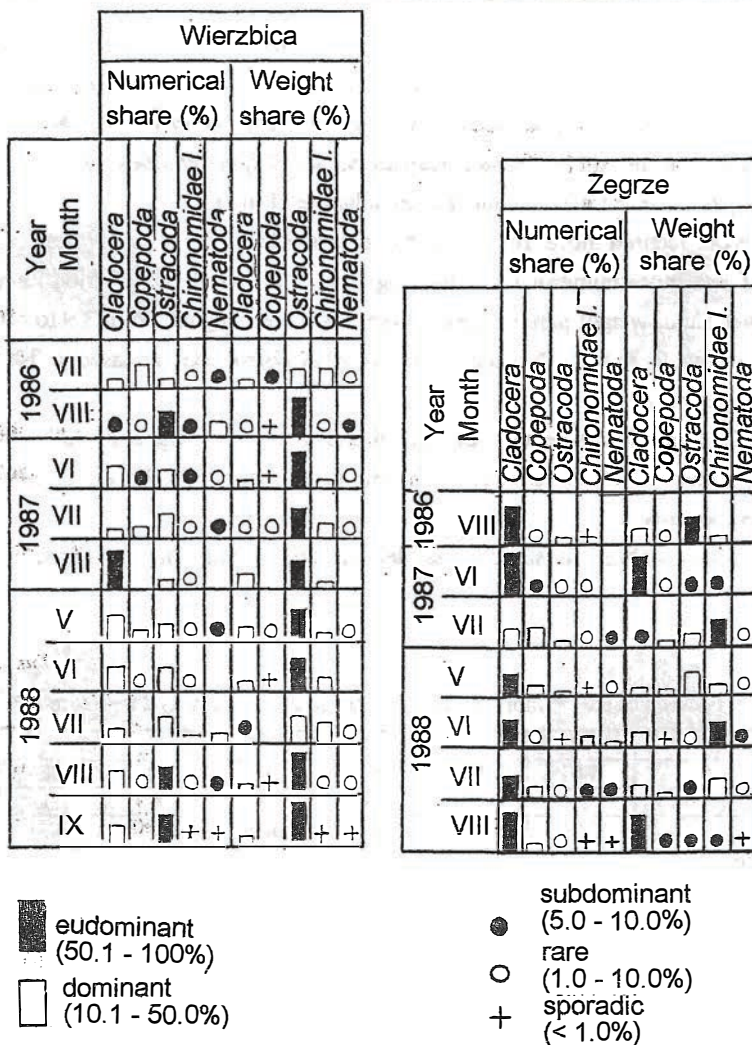


Fig. 2. Numerical and weight share of the main components of the diet of spined loach collected at Wierzbica and Zegrze

Station Zegrze

Cladocera were found in the food tracts of all fish (Fig 2, Tab. 4). They represented from 35.5% to 88.8% of the numbers of food organisms. In weight terms they classified as eudominants and subdominants, representing from 19.8% to 82.1%, with the exception of July 1987. Representatives of *Chydoridae* family were most frequent: *Chydorus* sp., *Alona* sp., *Camptocercus* sp., *Pleuroxus* sp.

Spined loach caught at the station Zegrze consumed considerable amounts of *Chironomidae* larvae (Fig. 2, Tab. 2). They constituted from 0.32% to 26.1% of all prey organisms and from 6.7% to 51.7% of their weight. *Stictochironomus* sp. (5.4-45.4% of food weight since June till August 1988), *Tanytarsus* so., *Glyptotendipes* sp., *Chironomus* sp. and *Cricotopus* sp. were most frequently eaten larvae (Tab. 4).

Copepoda occurred more frequently than *Ostracoda* in spined loach diet at this station. They were also more numerous, constituting from 2.1% to 38.5% of food item numbers. On the other hand, weight percentages of *Ostracoda* were higher, from 3.9 to 50.6% of the food weight (Fig. 2, Tab. 4). Numbers and weight of *Ostracoda* increased in fish food since May till August.

Small (2-3 mm long) nematodes were found in the food tracts of 33.3% of the fish. They represented 0.3-10.2% as regards the numbers, and 0.4-9.9% as regards the weight of food components.

Fish at this station consumed less detritus and periphyton compared with station Wierzbica.

Table 4

Frequency of occurrence (%) of more important items in spined loach food tracts from Zegrze station

Year	1986	1987		1988			
Month	VIII	VI	VII	V	VI	VII	VIII
Number of full tracts	21	2	8	3	8	11	7
<i>Alona</i> sp.	47.6	100.0	100.0	100.0	87.5	100.0	100.0
<i>Leydigia</i> sp.	-	50.0	-	-	-	-	-
<i>Chydorus</i> sp.	95.2	100.0	75.0	100.0	100.0	81.8	100.0
<i>Eurycercus</i> sp.	19.0	-	37.5	-	-	18.2	71.4
<i>Pleuroxus</i> sp.	61.9	100.0	37.5	-	-	9.1	-
<i>Champtocercus</i> sp.	66.7	-	-	-	-	18.2	85.7
<i>Bosmina</i> sp.	-	100.0	-	-	-	-	-
<i>Leptodora</i> sp.	-	-	25.0	-	-	-	-
<i>Cladocera</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Copepoda</i>	61.9	100.0	87.5	100.0	62.5	100.0	100.0
<i>Ostracoda</i>	85.7	100.0	100.0	100.0	50.0	45.5	28.6
<i>Stictochironomus</i> sp.	-	-	-	-	100.0	36.4	28.6
<i>Procladius</i> sp.	9.5	-	-	33.3	12.5	-	-
<i>Chironomus</i> sp.	9.5	50.0	50.0	-	-	-	-
<i>Polypedium</i> sp.	-	-	-	-	-	-	-
<i>Glyptotendipes</i> sp.	19.0	-	37.5	-	12.5	-	-
<i>Tanytarsus</i> sp.	-	100.0	12.5	-	-	27.3	28.6
<i>Cricotopus</i> sp.	4.8	-	12.5	-	12.5	27.3	-
<i>Chironomidae</i> l.	38.1	100.0	75.0	33.3	100.0	81.8	57.1
<i>Oligochaeta</i>	76.2	100.0	100.0	100.0	100.0	100.0	100.0
<i>Nematoda</i>	-	-	37.5	33.3	100.0	45.5	28.6
Detritus	-	-	87.5	100.0	100.0	-	-
Periphyton	-	-	-	100.0	100.0	-	-

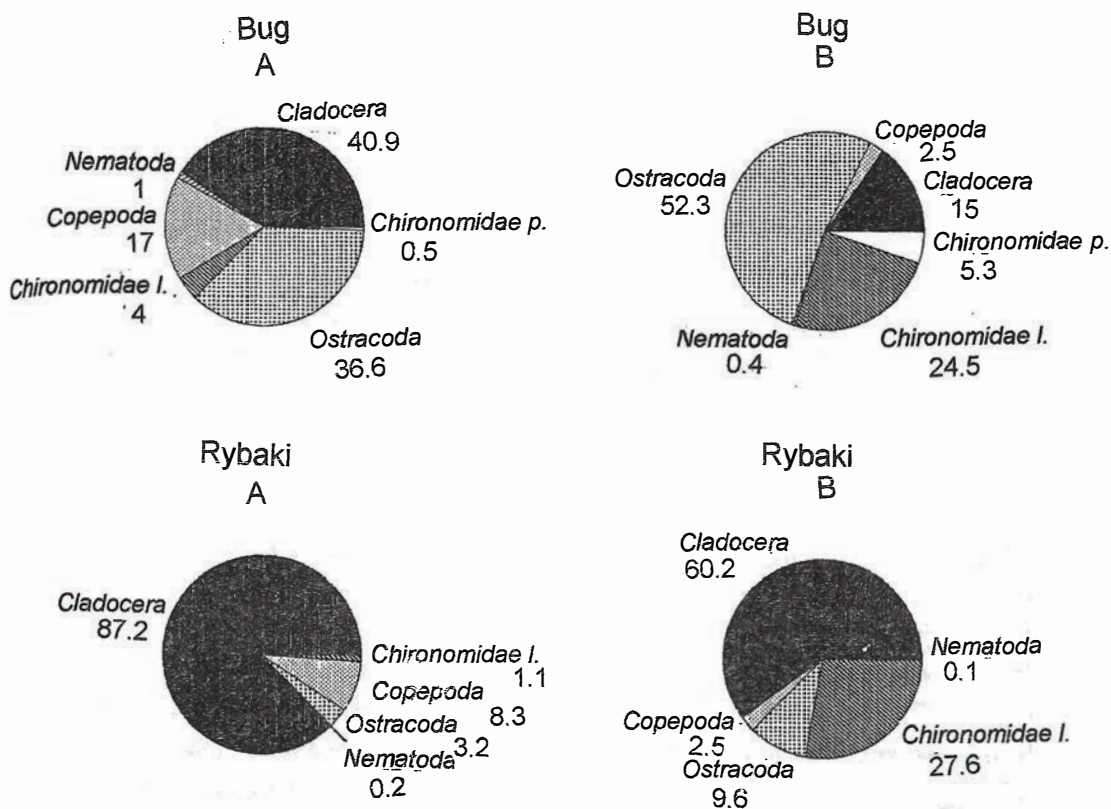


Fig. 3. Numerical (A) and weight (B) share of the main components of the diet of spined loach collected at Bug and Rybaki

Station Bug

As regards food weight, *Ostracoda* were most important at this station (52.2% of the food weight). They were found in 81.3% of the fish (Fig. 3, Tab. 2, 5).

Cladocera were the most frequent food components. They were consumed by 93.7% of the fish. These organisms dominated also with respect to the numbers, representing 40.9% of the diet components. Weight share of cladocerans in the diet amounted to 15.0%. *Alona sp.* and *Leydigia sp.* were most frequent (Tab. 5).

Chironomus sp. and *Glyptotendipes sp.* were the most frequently eaten *Chironomidae* larvae. They constituted 4.0% of the numbers and 24.5% of the fish food weight.

Copepods were consumed by 68.7% of the fish. These organisms represented 17.0% of the amount and 2.5% of the weight of food components.

Spined loach at this station consumed nematodes less frequently (25% of the fish) than at the Wierzbica and Zegrze. Half of the examined food tracts contained detritus and periphyton, and three quarters contained *Oligochaeta* (Tab. 5). *Chironomidae* pupae were found in the fish diet only at this station. Fish food at station Bug was similar to that at Zegrze.

Station Rybaki

Table 5

Frequency of occurrence (%) of more important items in spined loach food tracts from Rybaki and Bug station

Station	Rybaki	Bug
Number of full tracts	20	16
<i>Alona</i> sp.	100.0	75.0
<i>Leydigia</i> sp.	-	31.3
<i>Chydorus</i> sp.	100.0	12.5
<i>Pleuroxus</i> sp.	33.3	18.7
<i>Champtocercus</i> sp.	5.0	-
<i>Cladocera</i>	100.0	93.7
<i>Copepoda</i>	60.0	68.7
<i>Ostracoda</i>	35.0	81.3
<i>Stictochironomus</i> sp.	15.0	-
<i>Procladius</i> sp.	15.0	12.5
<i>Chironomus</i> sp.	45.0	50.0
<i>Polypedium</i> sp.	10.0	12.5
<i>Glyptotendipes</i> sp.	20.0	31.3
<i>Tanytarsus</i> sp.	10.0	12.5
<i>Cricotopus</i> sp.	-	6.3
<i>Chironomidae</i> l.	60.0	68.7
<i>Oligochaeta</i>	90.0	75.0
<i>Nematoda</i>	10.0	25.0
Detritus	5.0	68.7
Periphyton	-	43.8

Cladocera were found in the food tracts of all fish (Fig. 3, Tab. 5). Number of these crustaceans represented 87.2% of the food organisms, and their weight 60.2% (90% of them belonged to the genus *Alona* sp.).

Chironomidae larvae were represented 27.6% of the food weight. *Chironomus* sp. and *Glyptotendipes* sp. were most frequent; they represented 17.2% and 8.9% of the food weight respectively.

Copepods were the third important component of spined loach diet at this station. They represented 8.3% of the numbers and 2.5% of the food weight (Tab. 2, 5).

Ostracoda and *Nematoda* were less important at this station than at Wierzbica. *Ostracoda* were found in the food tracts of 35% of the fish. They constituted 3.2% of the numbers and 9.5% of the weight of food components. *Nematoda* were consumed sporadically. *Oligochaeta* were found in 90% of the weight of food tracts. Spined loach at station Rybaki did not consume periphyton and detritus (Tab. 5).

DISCUSSION

Feeding places of spined loach in Zegrzyński Dam Reservoir

Comparison of benthos abundance (Kuklińska 1989) and fish diet at particular stations suggests that spined loach fed on the dominating (both in numbers and weight) benthic organisms. Diet composition reflected environmental conditions at all stations. Analysis of the diet components (in this of species composition of *Chironomidae* larvae) at particular stations revealed that spined loach grazed on the bottom, at the depth 0.2 - 2.0 m. The fish

penetrated bottom areas of the littoral, consuming typically benthic organisms as well as those living on plants. Invertebrates which were most abundant in the given habitat were the prey of spined loach.

Size of fish samples collected for the studies on feeding behaviour reflected the share of spined loach in the fish communities at particular stations. In 1986-1989 the most numerous samples (totally 833 fish) were collected at Wierzbica. The respective numbers for other stations were: 100 at Zegrze, 65 at Bug and 30 at Rybaki (Grudniewski 1990). Spined loach was caught each month only at Wierzbica station. Feeding conditions at this station did not differ much from those at other stations, and frequently densities and biomass of benthic fauna were even higher at other stations, for instance at Bug. Spined loach represented 0.22% of all fish caught at Wierzbica, 0.06% at Zegrze, 0.04% at Bug, and 0.02% at Rybaki (Grudniewski 1990).

It may be assumed that spined loach prefers specific environmental conditions. Distribution of this fish in Great Ouse River (Robotham 1978) suggests that it selected habitats with soft organic substrate, slow water flow, about 0.148 m/s. It was found that distribution of spined loach change seasonally according to the rate of water flow, which caused sedimentation, erosion of the organic substrate. Type of the substrate caused that the fish gathered in winter at a bottom of hole 3 m² in area and with maximum depth 1.5 m. Spined loach selected bottom covered with sand and mud, containing dead and alive *Cladophora*, the range of sediment particles being 0.15-1.016 mm, with the smallest particles up to 0.05 mm. There were no spined loach in places where water current amounted to 0.293 m/s (Robotham 1978).

From among the four sampling stations in Zegrzyński Dam Reservoir, Wierzbica and Zegrze were characterized by environmental conditions similar to those described for Great Ouse River. Bottom was covered with mud with sand layer, overgrown with soft vegetation in the case of Wierzbica. Conditions at the two stations resembled those in lakes. The other two stations were characterized by more rapid water flow, from 0.20 to 0.25 m/s in the case of Bug station. It is possible that more numerous occurrence of spined loach at Wierzbica and its continuous presence in the fish catch may be explained by the character of the bottom. Possible occurrence of fish at other stations was due to its migrations in search of a suitable habitat at changing environmental conditions.

Food of spined loach in other water bodies

Food of spined loach in Wschodnia River consisted of higher and lower plants. They were found in half of the fish food tracts. As regards the animal organisms, *Cladocera* (mainly *Daphnia* sp.), *Copepoda*, *Gammarus* sp., *Chironomidae* larvae (from the subfamilies *Pelopiinae* and *Orthocladinae*) were dominating. Diet of most fish contained mud with some detritus and some *Trichoptera* larvae and pupae (Skóra 1966).

Białokoz (1986) stated that juvenile spined loach fed on small zooplankton, while the older fish consumed plankton and benthic crustaceans, insect larvae and plant remnants. Spined loach in lakes near Węgorzewo (Leszczyński 1963) consumed littoral *Cladocera* (mainly *Chydoridae*), littoral *Chironomidae* larvae as well as *Ephemeroptera* and *Trichoptera* larvae.

Food composition of spined loach from Amur River tributaries (Nikolski 1956) was similar to that of the fish population. *Cladocera* (mainly *Chydoridae*), *Copepoda*, *Ostracoda* and *Chironomidae* (*Glyptotendipes* sp., *Polypedilum* sp.) were found in 80.0% of the food tracts. All fish consumed *Nematoda*, *Oligochaeta* and diatoms (plant periphyton). Juvenile spined loach from Kursu Reservoir in Lithuania (Vashkevichjute 1959) consumed zooplankton in 83.3%, in this 70.8% were *Cladocera*, 8.3% *Copepoda*. 16.6% were represented by *Chironomidae* and in rare cases by some filamentous algae. Bigger fish, 57-64 mm, grazed on zooplankton (77%), *Chironomidae* larvae (12.6%) and *Ostracoda* (10.6%). Zooplankton was also basic food of fish bigger than 70.0 mm, but these fish consumed more (up to 31.0%) *Chironomidae* larvae.

CONCLUSIONS

1. Main components of the diet of spined loach were: crustaceans from the suborder *Cladocera*, order *Copepoda* and *Ostracoda*, *Chironomidae* larvae and small *Nematoda*. The organisms belonging to *Cladocera*, *Ostracoda* and *Chironomidae* were the eudominants (50.1-100% of the organisms numbers and weight) or the dominants (10.1-50.0%). Crustaceans belonging to *Copepoda* usually were the dominants or subdominants, representing from 5.1 to 50.0 % with respect to the numbers and weight. *Nematoda* were usually rare, from 1.0 to 5.0% of the food organism numbers. *Oligochaeta*, detritus and periphyton were present in the diet of most fish.
2. Analysis of diet components (in this of species composition of *Chironomidae* larvae) at the four sampling stations proved that spined loach grazed at the bottom, at depth of 0.2 to 2.0 m. Searching for food the fish penetrated bottom areas of the littoral zone, consuming both typically benthic organisms and those living on plants.
3. Sample size at particular stations revealed that spined loach preferred specific habitats, so that distribution of this fish showed seasonal variations.

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POKARM KOZY, *COBITIS TAENIA* (L.) Z ZEGRZYŃSKIEGO ZBIORNIKA ZAPOROWEGO

STRESZCZENIE

Badania przeprowadzono na podstawie zawartości przewodów pokarmowych 323 ryb odłowionych w okresie od lipca do września 1986 roku, od czerwca do sierpnia 1987, od maja do września 1988 i w maju 1989 roku.

Głównymi składnikami pokarmu kozy były: skorupiaki, należące do podrzędu *Cladocera*, rzędu *Copepoda* i *Ostracoda*, larwy muchówek z rodziny *Chironomidae* oraz drobne nicienie *Nematoda*. Organizmy należące do *Cladocera*, *Ostracoda* i *Chironomidae* tworzyły grupę eudominantów (50.1-100.0% udziału liczbowego, wagowego) i dominantów (10.1-50.0% udziału). Skorupiaki należące do *Copepoda* najczęściej tworzyły grupę dominantów i subdominantów, stanowiąc od 5.1 do 50.0% udziału wagowego i liczbowego. Nicienie najczęściej określane jako nieliczny składnik pokarmu,

stanowiły od 1.0 do 5.0% udziału liczbowego. W diecie większości ryb obecne były skąposzczety oraz detrytus i peryfiton.

Analiza komponentów diety ryb (w tym składu gatunkowego larw Chironomidae) z czterech stanowisk dowodzi, że żerowały one na dnie zbiornika, na głębokości od 0.2 do 2.0 m. W poszukiwaniu pokarmu kozy penetrowały przydenne warstwy litoralu zbiornika, zjadając organizmy zarówno typowo dennie jak i naroślinne.

Na podstawie liczebności prób z poszczególnych stanowisk ustalono, że kozy preferują określone warunki bytowania, z czym związane są sezonowe zmiany rozszedlenia tego gatunku.

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