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Fishes parasite fauna of *Anarhichadidae* and *Pleuronectidae* families from the Northwest Atlantic

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Abstract

For lack of studies ecological peculiarities of parasite fauna of Anarhichas lupus, A.minor, Reinchardtius hippoglossoides, Hippoglossus hippoglossus, Hippoglossoides platessoides, Glyptocephalus cynoglossus, were traced. 48 species of parasites were discovered. H.hippoglossus (23 species) has the richest parasite fauna and A.minor (11 species) - the poorest. From the total number of parasites only 7 came to be common for fish families Anarhichadidae and Pleuronectidae.The rate of infection by common parasites appeared to be very small which is the evidence of drastic difference of fish ecology included in these families in spite of somewhat equal conditions of their life.

There are signs of distinction in parasite composition and ecology among closely related fishes. For example, A.minor in contrast to A.lupus lacks for Fellodistomum fellis the infection by which is connected with eating up of Ophiura sarsi, and A.lupus compared to A.minor has wider trophic links borne out by a great number of non-specific species in parasite fauna of catfish (Anarhichas lupus). Only 3 types of trematodes which are very characteristic for predators in contradistinction from other flounders were registered in R.hoppoglossoides. A great number of trematodes and widely spread species were found to be peculiar to H.hippoglossus and H.platessoides - the indication of prevailing of benthos in a food and also of wide trophic links of these fishes.

Comparing parasite faunas of the fishes studied with the fauna of analogous species in the Barents and White Seas the great extent of their similarity was evident, which is perhaps not occasionally. This phenomenon is also connected with the historical formation ground of fish parasite cenosis in the regions mentiones.

Results

By now the fish parasite fauna related to the families Anarhichadidae and Pleuronectidae is not examined properly. In particular intercourse ecological aspects in the chain parasite - host are very mich to be desired.

Collections of parasites made in 1975-1978 in different regions of shelf and Northwest Atlantic continental slope (50°00'-63°00'N) served as a source of this paper. 99 specimens (Anarhichas lupus - 15, A.minor - 12, Reinchardtius hippoglossoides - 20, Hippoglossus hippoglossus - 10, Hippoglossoides platessoides - 27, Glyptocephalus cynoglossus - 15) were examined by the method of complete parasitological dissection (Dogiel, 1933; Bykhovskaya-Pavlovskaya, 1969). Species diagnostics of parasites was made both on alive fishes and on total preparations. Infection percentage in tables is given only when the number of the fishes dissected was no less than 12.

48 species of parasites related to seven taxonomic groups (Myxosporidia - 7, Cestoda - 4, Trematoda - 25, Nematoda - 5, Acanthocephala - 2, Hirudinea - 1, Crustacea - 4) were discovered.

14 species of parasites were met among Anarhichadidae (Table 1). Trematodes Fellodistomum agnotum and Acanthopsolus anarrhichae appeared to be the most common parasites of cat-fish. The infection intensities by these parasites were 117 and 1363 specimens per one fish and the infection incidences were 53.3% and 46.6% respectively. Anarhichas lupus is very much infected by some other species, for example trematodes Lepidophillum steenstrupii (80% average infection intensity - 6.73 spec.), Fellodistomum fellis (66.7% and 22.6 spec.), Plagioporus idoneus (40% and 7.93 spec.) and Platibdella anarrhichae (40% and 1 spec.).

An insignificant qualitative parasite variety with the direct development cycle, especially Myxosporidia and also a rater weak parasite infection (Terranova decipiens, Capillaria kabatai, Ascorophis morruae) whose invasion perhaps is connected with the eating up decapods Pagurus pubescens, Eualus gaimardi, Hetairus polaris, Spirontocaris spinus, Pandalus borealis, Sclerocrangon boreas are typical for cat-fish parasite fauna (Uspenskaya, 1963). On the other hand, cat-fish is very much infected by parasites whose development cycle is connected with benthic organisms Acanthopsolus anarrhichae infection by which may be seen in proœss of eating up of snail mollusc Buccinum undatum (Lebour, 1911, 1918) and also perhaps of B.groenlandicum (Zelikman, 1966), Fellodistomum fellis whose second intermediate host is sublyteral echinoderm Ophiura sarsi (Chubrik, 1952, 1966) could be included in this number. The development cycle of F.agnotum is also perhaps connected with the same animal group. The first intermediate host of Steringophorus furciger is a bivalve mollusc Nuculana pernula (Chubrik, 1966). Since according to the same author, larvae already at this stage become invasional, it is supposed that catfish eating up N.pernula gains these parasites.

Catfish (Table 2) had 11 species of parasites, 8 of them (excluding Myxidium sphaericum, Pseudophyliidea gen.sp., Steringophorus furciger) are characteristic for catfish. The extent of infection by these parasites excluding Clavellodes rugosa is very high, for example the infection by Steganoderma spinosa reaches 183 specimens (17.67 spec. in the average), by Acanthopsolus anarrhichas) - 764 spec. (88.4 spec. in the average) and Diphterostomum microacetabulum - 5000 spec. (449.25 spec. in the average).

Parasite faunas of common catfish and spotted catfish in spite of the availability of eight common species (Myxidium sphaericum, Plagioporus idoneus, Lepidophyllum steenstrupii, F.agnotum, S.furciger, A.anarrhichae, P.anarrhichae, C.rugosa), still greatly differ (first of all, by the absence of Fellodistomum fellis, the second intermediate host of which is Ophiura sarsi is observed both in coastal zone and in the depths of

up to 3000 m. The absence of F.fellis among catfish parasites evidences of the absence of this very Ophiura in its food. On the other hand, according to the high extend of fish infection by different trematodes other benthic animals - molluscs, starfishes and Echinoidea - play the major part in a food. All those facts are an indication of the seeming ecological difference between common catfish and spotted catfish. But at the definite times of the year spotted catfish together with common catfish migrate to the coastal regions where they are infected by Acanthopsolus anarrhichae. The intermediate host of the latter (B.undatum) is found only at the depths less than 150 m. During the periods mentioned catfish eats this mollusc actively according to the high invasion intensity of N.lageniformis.

The situation is quite different when dealing with Pleuronectidae family fishes. One representative of this family - Greenland halibut (R.hippoglossoides) - has 15 species of parasites (Table 3), and 6 of them have the direct development cycle (Myxidium sphaericum, Ortholinea divergens, Myxoproteus sp., Ceratomyxa drepanopsettae, C.ramosa, Hatschekia hippoglossi). Myxosporidia are widely represented in qualitative aspect (5 species), cestoda (3 species) and trematodes (3 species), and if we take into account quntitative side we may see that halibut is very much infected ispecially by C.drepanopsettae (75.0%), Contracaecum aduncum (55.0%), Scolex pleuronectis l. (65.0%) and Derogenes varicus (70.0%). Invasion intensity with the two latter species is also very high (two average intensities of contamination are equal to 8 specimens and 4.65 specimens per one fish respectively). From parasites met among Greenland halibut there are species typical only for flounders (Ortholinea divergens, Ceratomixa drepanopsettae, C.ramosa, Steringophorus furciger), species characteristic only for halibut (Myxoproteus sp., Hatschekia hippoglossi), and a very large group of widely spread species (Myxidium sphaericum), Phylobothrium tridex L., Grilotia erinaceus l., Scolex pleuronectis l., Derogenes varicus, Lecithaster gibbosus, Contracaecum aduncum, Anisakis sp. l., Corynosoma strumosum) are represented. From 15 parasites discovered among Gree

Greenland halibut, 9 have complex development cycle. There are parasites (Derogenes varicus, C.aduncum l., Anisakis sp. l.) whose intermediate hosts are both plankton copepodes, euphausids pelagic, Coelenterata, Chactognata (Ctenophora, medusae, Sagitta) (Daves, 1959; Lebour, 1918, 1935; Dollfus, 1923, 1927; Dollfus, Anantharaman et Nair, 1954; Wülker, 1930; Markowski, 1937; Myers, 1956; Hanumantha - Rao, 1958; Anantharaman, 1959; Uspenskaya, 1963; Zelikman, 1966; Smith, 1971) and benthos, nektobentos, nekton (amphipods, decapods, cephalopod molluscs) (Wülker, 1930; Uspenskaya, 1963; Shiraki, Hasegava, Kenmotsu, Otsuru, 1976). Species (Steringophorus furciger, Corynosoma strumosum, Contracaecum aduncum) infection by which is taking place only while eating up the benthos (bevalve molluscs, Gammarus) (Zelikman, 1966; Chubrik, 1966) and fishes, According to K.G.Konstantinov's data (1976) on feeding of Greenland halibut decapods and fish play the major part in the food of Greenland halibut judging by the high extend of fish infection by D.varicus, C.aduncum and Anisakis sp.1. Perhaps when eating up the fish palibut gains also S.pleuronectis l. and L.gibbosus whose development cycle is connected with plankton and which are accumulated in predators' organisms. Of course we don't exclude the possibility of incidental infection by some of these parasites. This process goes simultaneously while swallowing up the plankton with other components of food. Greenland halibut is a bottom fish and as a result we get quntitative different Myxosporidia (5 species). At the same time its parasite fauna lacks for many species characteristic for flounders. Fauna is especially poor of flukes which is perhaps related with rapaciousness and small specific weight in amphipod food. Parasite fauna of true halibut (H.hippoglossus) is richer than the same of Greenland halibut (23 species of parasites, Table 4). Six species (Myxidium sphaericum, Leptotheca sp., Ceratomyxa drepanopsettae, C.ramosa, Hatschekia hippoglossi, Lepeophteirus hippoglossi) have the direct development cycle. From them halibut is much infected by C.drepanopsettae (6 specimens out of 10 dissected) and also with H.hippoglossi (5 out of 10). From parasites with the complex development cycle infections of halibut by Scolex pleuronectis l. (7 out of 10), by Derogenes varicus (9 out of 10) and Contracae-

cum aduncum l.(5 out of 10) stand out. True halibut parasite fauna is different from the previous one by qualitative richness of trematodes (11 species against 3). The development cycle of most of them (Podocotyle reflexa, Steganoderma formosum, Stenacron vetustum, Steringophorus furciger, Stephanochasmus baccatus, Derogenes varicus, Gonocerca phycidis) is connected with benthos (mollusca, amphipodes) and nektobenthos (decapods) (Zelikman, 1966; Chubrik, 1966; Uspenskaya, 1963) and when they are eaten the infection of halibut by these trematodes is taking place. The infection of halibut by Anisakis special l. and Echinorhynchus gadi is also connected with amphipodes and decapods (Uspenskaya, 1963; Shiraki, Hasegava, Kenmotsu, Otsuru, 1976; Shulman, Shulman-Albowa, 1953). These groups of animals play perhaps the main role in halibut food. The fish according to absence of mature C.aduncum is not the main object of halibut food. The same could be said of plankton copepods, and slight infection by Lecithaster gibbosus and L.confusus is the evidence of it. It is possible that other pelagic animals such as medusas, Ctenofora, Sagittas, Cephalopoda play some role in halibut food and at the same time serve as intermediate hosts of Hemiurus levinseni, D.varicus and C.aduncum l. (Lebour, 1918, 1935; Dollfus, 1923, 1927; Dollfus, Anantharaman et Nair, 1954; Wülker, 1930; Markowski, 1937; Myers, 1956; Hanumantha-Rao, 1958; Anantharaman, 1959; Daves, 1959; Uspenskaya, 1963; Zelikman, 1966), but infection by them may be connected also with fish which is reserve host of these parasites.

There are many parasites in true halibut parasite fauna specific for flounders (Ceratomyxa drepanopsettae, Steringophorus furciger, Stenakron vetustum) and also for halibuts (Leptotheca sp., C.ramosa, Steganoderma formosum, Stephanochasmus baccatus, Hatschekia hippoglossi, Lepeoptheirus hippoglossi). There are also many species which have wide range of distribution (Phyllobothrium tridax l., Scolex pleuronectis l., Podocotyle reflexa, H.levinseni, D.varicus, L.gibbosus, L.confusus, Contracaecum aduncum, Anisakis sp. l.). Like the previous species true halibut

is a bottom fish usually registered in shoals, this resulted in the richness of parasite composition with the direct development cycle.

Long rough dab parasite fauna consists of 21 species. In qualitative aspect trematodes (10 species) are very richly represented. Parasites with direct development cycle are represented with 5 species (Myxidium sphaericum, Myxoproteus sp. l., Orthocolinea divergens, Ceratomyxa drepanopsettae, Acanthochondria cornuta). Long rough dab is infected especially by M.sphaericum (44.4%), C.drepanopsettae (62.9%), Rodotrema ovacutum (44.4%), Steringophorus furciger (51.9%), Contracaecum aduncum l. (44.4%), Echinorhynchus gadi (44.4%). Invasion intensity by some of these species is also high. Thus infection by R.ovacutum reaches 84 specimens (6.89 specimens per one fish in the average), by C.aduncum - 87 specimens (4.37 specimens per one fish in the average), by E.gadi - 42 specimens (3.96 specimens in the average) and S.furciger - 136 specimens (10.52 specimens in the average). According to the parasite composition different benthic animals are richly represented in the food of long rough dab. Gastropod and bivalve molluscs, intermediate hosts of R.ovacutum, Stenakron vetustum, Zoogonoides viviparus and S.furciger (Chubrik, 1966; Zelikman, 1966), amphipodes and decapods (Amphithoe rumbricata, Gammarus locusta, Pontoporeia femorata, Calliopius rathkei, Carpella septentrionalis, Pagurus pubescens, Sclerocrangon boreas, Pandalus borealis, etc.) may perhaps be included in this number and with which development cycle of Derogenes varicus, Contracaecum aduncum l., Terranova decipiens l., Anisakis sp. l., E.gadi (Shulman, Shulman-Albowa, 1953; Uspenskaya, 1963; Shiraki, Hasegawa, Kenmotsu, Otsuru, 1976). Plankton with which the development of Scolex pleuronectis l., Lecithaster gibbosus and D.varicus, C.aduncum l., Anisakis sp. l. (Lebour, 1918, 1935; Dollfus, 1923, 1927;
Dollfus, Anantharaman et Nair, 1954; Markowski, 1937; Myers, 1956; Hanumantha-Rao, 1958; Daves, 1959; Anantharaman, 1959; Uspenskaya, 1963; Zelikman, 1966; Smith, 1971) seems also to be met in flounder food. All this confirms Pitt's data (Pitt, 1973) concerning long rough dab feeding taken on the Grand Newfoundland

Bank. Long rough dab is a typical bottom-feeding fish - the fact which is proved not only by the rich qualitative composition and strong infection with trematodes but also by a rater heavy invasion with Myxosporidia.

The poorest in qualitative aspect is parasite fauna of witch (13 species of parasites were discovered in it, Table 6). By the rate of infection Ceratomyxa drepanopsettae (46.6%), Stenacron vetustum (66.6%, mean infection intensity - 44,7 spec., Echinorhynchus gadi (40.0% and 2.83 spec.) are the first parasites. With the two latter species witch gets infected when eating up gastropod molluscs and amphipodes, which are intermediate hosts of these parasites and serve perhaps as the main components in the food. Decapods and plankton in the food of this flounder don't seem to play a great role and single founds of Scolex pleuronectis l., Derogenes varicus, Contracaecum aduncum l., Anisakis sp. l., Ascarophis morruae are good evidences of all this.

Discussions

Comparing parasite faunas of these typical bottom fishes in systematic aspect related to remote families Anarhichadidae and Pleuronectidae 7 species appeared to be common. Three of them (Rodotrema ovacutum, Steringophorus furciger, Genolinea laticauda) are specific flounder parasites; Myxidium sphaericum, Capillaria kabatai, Ascorophis morruae are characteristic for Gadidae and Terranova decipiens is widely distributed in general. The extent of the infection by these parasites is not high and this allows to assert that despite the fact of similarity of their life conditions and some common food components the ecologies of these fishes differ greatly. This in its turn specifies parasite faunas of the species concerned (in catfishes it is traced more brightly than in flounders because of the presence of widely spread parasites such as Scolex pleuronectis l., Derogenes varicus, Lecithaster gibbosus, Contracaecum aduncum.

There are signs of distinction in parasite composition and ecology even among closely related fishes. For example, the fact that spotted sea cat lacks for Fellodistomum fellis evidences

of the absence of Ophiura sarsi in its food - the intermediate host of this parasite. But in a food of common wolffish this Ophiura plays a major part. Parasite fauna of spotted sea cat consists almost utterly of parasites specific for Anarhichadidae (excluding M.sphaericum, S.furciger) which is peculiar to cod and flounder. At the same time common wolffish has much more non-specific parasites (M.sphaericum, R.ovacutum, S.furciger, G.laticauda, T.decipiens, C.kabatai, A.morruae) which evidences of wider trophic links of common wolffish.

There even more signs of distinction in parasite composition, and consequently in ecology of flounder fishes. Parasite fauna of a typical predater - Greenland halibut - is characterized by a small number of trematodes and great infection by parasites gained while eating up fishes. For 3 other flounder species qualitative variety of trematodes and consequently a great role of benthos in their food is characteristic. This to some extent brings 3 flounder species mentioned together. But a great number of widely spread species long rough dab and halibut have compared with Glyptocephalus indicates that trophic links of the first two species are wider and that the activity of these fishes when searching for food is greater. The fact that halibut lacks for Rodotrema ovacutum and a high degree of infection by Steringophorus furciger indicates in its turn that the role of molluscs in its food - the main food of long rough dab and Glyptocephalus - is not great.

Thus some similarity of parasite faunas of Anarhichadidae and Pleuronectidae stipulated by common conditions of life doesn't point to common ecology of neither fishes related to two different families nor closely related fishes. Many signs of distinction of parasite faunas' composition point to gone phylogenetic links of fish families Anarhichadidae and Pleuronectidae.

Quite an interesting picture we get comparing parasite faunas of the examined fishes with the same species from the Barents Sea. Yu.I.Polyansky (1955) points out 21 species of parasites (we have 17) for two catfishes from the White Sea; 11 species (40.7%) appeared to be common. This extent of similarity is very high taking into consideration that all characteristic for catfishes

species were included in the list of common parasites and those species which were not (Podocotile atomon, P.reflexa, Derogenes varicus, Scolex pleuronectis l., Zoogonoides viviparus, Prosorhynchus scuamatus, Bothriocephalus scorpii, Contracaecum aduncum, Anisakis sp. l., Echinorhynchus gadi) were peculiar to other fishes, flounders for example, and could possibly by characteristic for catfishes.

Slightly less number of common parasites (7 species) exists in parasite fauna of White Sea catfish which S.S.Shulman and R.E.Shulman-Albowa (1953) point out 21 species of parasites. But in this case also the majority of the species left (excluding Myxoproteus elongatus, Genarches mülleri, Tocotrema sp. l., Corynosoma semerme) were found peculiar to other fishes examined. When we examine the White Sea parasite founa formation the freshering of water influencing some specificity of parasite cenosis in this reservoir should be considered.

Parasite founa of flounder fishes is also characterized by quite a number of common species. Thus out of 18 species of parasites found to be peculiar to halibut from the Barents Sea (Polyansky, 1955) 13 of them belong to the same fish of the North-West Atlantic; and out of 16 parasites imputed by the same author among long rough dab 12 appeared to be common (48.0%).

The great extent of geographically distant catfish and flounder parasite faunas simalarity is not accidental.It evidences of parasite cenos historic formation community of fishes of the regions concerned.

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TABLE 1. Parasite fauna of stripped catfish Anarhichas lupus.

	The name of parasite	15 specimens examined				
		Number of fishes infected	% of infection	Intensity of infection, spec.		
				min	max	average
1	Myxidium sphaericum	3	20,0	+	+	+
2	Plagioporus idoneus	6	40,0	1	42	7,93
3	Lepidophyllum steenstrupii	12	80,0	1	44	6,73
4	Rodotrema ovacutum	1	6,6	1	1	0,07
5	Fellodistomum agnotum	8	53,3	1	117	11,87
6	Fellodistomum fellis	10	66,7	1	90	22,60
7	Steringophorus furciger	3	20,0	1	19	1,47
8	Acanthopsolus anarrhichae	7	46,6	4	1364	180,53
9	Genolinea laticauda	1	6,6	1	1	0,07
10	Terranova decipiens	1	6,6	2	2	0,13
11	Capillaria kabatai	2	13,3	1	2	0,20
12	Ascorophis morruae	1	6,6	1	1	0,07
13	Platybdella anarrhichae	6	40,0	1	8	1,00
14	Clavellodes rugosa	2	13,3	4	5	0,60

TABLE 2. Parasite fauna of spotted catfish Anarhichas minor.

	The name of parasite	12 specimens examined				
		Number of fishes infected	% of infection	Intensity of infection, spec.		
				min	max	average
1	Myxidium sphaericum	1	8,3	+	+	+
2	Pseudophyllidea gen.sp.	1	8,3	1	1	0,08
3	Plagioporus idoneus	12	100,0	1	28	9,83
4	Diphterostomum microacetabulum	5	41,6	16	5000	449,25
5	Steganoderma spinosa	5	41,6	3	183	17,67
6	Lepidophyllum steenstrupii	6	50,0	1	16	2,92
7	Fellodistomum agnotum	8	66,6	1	82	18,92
8	Steringophorus furciger	1	6,6	2	2	0,17
9	Acanthopsolus anarrhichae	6	50,0	3	764	88,40
10	Platybdella anarrhichae	4	33,3	1	4	0,80
11	Clavellodes rugosa	1	6,6	1	1	0,80

TABLE 3. Parasite fauna of Greenland halibut-Reinchardtius hippoglossoides.

	The name of parasite	20 specimens examined				
		Number of fishes infected	% of infection	Intensity of infection, spec.		
				min	max	average
1	Myxidium sphaericum	2	10,0	+	+	+
2	Ortholinea divergens	5	25,0	+	+	+
3	Myxoproteus sp.	7	35,0	+	+	+
4	Ceratomyxa drepanopsettae	15	75,0	+	+	+
5	Ceratomyxa ramosa	1	5,0	+	+	+
6	Phyllobothrium tridax l.	1	5,0	1	1	0,05
7	Grillotia erinaceus l.	1	5,0	2	2	0,1
8	Scolex pleuronectis l.	13	65,0	1	37	8,0
9	Steringophorus furciger	6	30,0	1	10	1,1
10	Derogenes varicus	14	70,0	1	23	4,65
11	Lecithaster gibbosus	7	35,0	1	16	1,55
12	Contracaecum aduncum	11	55,0	1	5	1,1
	Contracaecum aduncum l.	4	20,0	1	2	0,25
13	Anisakis sp.l.	5	25,0	1	3	0,4
14	Corynosoma strumosum	2	10,0	1	1	0,10
15	Hatschekia hippoglossi	1	5,0	3	3	0,15

TABLE 4. Parasite fauna of true halibut-Hippoglossus hippoglossus.

	The name of parasite	10 specimens examined				
		Number of fishes infected	% of infection	Intensity of infection, spec.		
				min	max	average
1	Myxidium sphaericum	2	-	+	+	+
2	Leptotheca sp.	1	-	+	+	+
3	Ceratomyxa drepanopsettae	6	-	+	+	+
4	Ceratomyxa ramosa	1	-	+	+	+
5	Phyllobothrium tridax l.	1	-	1	1	0,1
6	Scolex pleuronectis l.	7	-	4	37	12,60
7	Podocotyle reflexa	1	-	1	1	0,1
8	Steganoderma formosum	2	-	1	2	0,30
9	Stenakron vetustum	4	-	1	13	2,20
10	Steringophorus furciger	1	-	1	1	0,1
11	Stephanochasmus baccatus	4	-	2	8	1,6
12	Hemiurus levinseni	2	-	1	4	0,5
13	Derogenes crassus	2	-	2	2	0,2
14	Derogenes varicus	9	-	2	23	9,10
15	Gonocerca phycidis	4	-	1	1	0,4
16	Lecithaster gibbosus	1	-	1	1	0,1
17	Lecithaster confusus	1	-	1	1	0,1
18	Contracaecum aduncum l.	5	-	1	2	0,6
19	Anisakis sp.l.	1	-	1	1	0,1
20	Capillaria kabatai	1	-	1	1	0,1
21	Echinorhynchus gadi	6	-	1	35	4,9
22	Hatschekia hippoglossi	5	-	1	5	1,50
23	Lepeophteirus hippoglossi	1	-	2	2	0,2

TABLE 5. Parasite fauna of long rough dab - Hippoglossoides platessoides.

	The name of parasite	27 specimens examined				
		Number of fishes infected	% of infection	Intensity of infection, spec.		
				min	max	average
1	Myxidium sphaericum	12	44,4	+	+	+
2	Myxoproteus sp.	4	14,8	+	+	+
3	Ortholinea divergens	2	7,4	+	+	+
4	Ceratomyxa drepanopsettae	17	62,9	+	+	+
5	Scolex pleuronectis l.	10	37,0	1	29	3,63
6	Aporocotyle simplex	3	11,1	1	1	0,11
7	Rodotrema ovacutum	12	44,4	1	84	6,89
8	Stenakron vetustum	1	3,7	1	1	0,04
9	Steringophorus furciger	14	51,9	1	156	10,52
10	Brachyphallus crenatus	1	13,7	1	1	0,04
11	Derogenes varicus	5	18,5	1	2	0,22
12	Genolinea laticauda	2	7,4	1	3	0,15
13	Lecithaster gibbosus	6	22,2	1	2	0,30
14	Zoogonoides viviparus	3	11,1	1	5	0,37
15	Trematoda gen.sp.	1	3,7	18	18	0,67
16	Contracaecum aduncum l.	12	44,4	1	87	4,37
17	Terranova dicipiens l.	2	7,4	1	1	0,07
18	Anisakis sp.l.	7	25,9	1	5	0,52
19	Capillaria kabatai	3	11,1	2	4	0,3
20	Echinorhynchus gadi	12	44,4	3	42	3,96
21	Acanthocheilis cornuta	8	29,6	1	1	0,3

TABLE 6. Parasite fauna of witch - Glypotocephalus cynoglossus.

	The name of parasite	15 specimens examined				
		Number of fishes infected	% of infection	Intensity of infection, spec.		
				min	max	average
1	Myxidium sphaericum	2	13,3	+	+	+
2	Ceratomyxa drepanopsettae	7	46,6	+	+	+
3	Scolex pleuronectis l.	3	20,0	2	4	0,53
4	Aporocotyle simplex	1	6,6	1	1	0,07
5	Stenakron vetustum	10	66,6	1	20	4,47
6	Steringophorus furciger	2	13,3	8	45	3,53
7	Derogenes varicus	1	26,6	1	3	0,53
8	Genolinea laticauda	5	33,3	1	2	0,53
9	Contracaecum aduncum l.	1	6,6	2	2	0,13
10	Anisakis sp.l.	1	6,6	3	3	0,20
11	Ascarophis morruae	1	6,6	1	1	0,07
12	Nematoda gen.sp.	1	6,6	1	1	0,07
13	Echinorhynchus gadi	6	40,0	1	24	2,83