

## Synopsis of the Parasites in Iranian Freshwater Fishes

Pazooki J.<sup>1</sup>; Masoumian M.<sup>2</sup>

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### Abstract

Two hundred forty seven species of parasites from Iranian freshwater fishes are presented in this synopsis. The parasites were recorded from infestations in fish from different parts of the country and summarized according to host species, organs where the parasite infestations occurred, province, faunal region and reference numbers. The following aspects of parasite infestations were also discussed: records of the most predominant parasites, the richest regions of parasite fauna, records of parasites according to province and the most severely infected fish species and finally host specificity in terms of exotic or endemic fish.

**Keywords:** Parasites, , Freshwater, fish, Iran

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Department of Biological Sciences, Shahid-Beheshty University. P. O. Box: 19834, Tehran. Iran.

Department of Fish Diseases, Iranian Fisheries Research Organization. P. O. Box: 14155-6116. Tehran. Iran.

Corresponding author's email: pazooki2001@yahoo.com

## Introduction

Iranian freshwater fish habitats can be categorized according to three different faunal regions: the Ponto-Caspian Territory of northern Iran, as a part of the Palaearctic zone; southeastern Iran that is greatly influenced by the Indian faunal region, and southwestern Iran that falls within the Mesopotamian intermediate faunal region (Fig. 1). Composition of the fish fauna distribution in Iran reflects these territorial differences. While the waters of Iran's Ponto-Caspian region are populated by fish species most commonly found in Europe; fish fauna of the Mesopotamian region supports endemic species including several barbells (Coad, 1970; Berg, 1940 in Jalali, 1999). There is little research available on the parasite fauna of these fish populations. More is known about the Caspian Sea faunal sub-region. Research on parasites of Iranian freshwater fishes began with the work of Bychovsky (1949) who recorded 4 species of *Dactylogyrus* and *Ancyrocephalus*. Subsequent research has pioneered surveys on the parasites associated with the various fish species in different parts of the country, Mokhayer (1974, 1981, 1982, 1983, 1990), Mokhayer and Anwar (1973), Eslami and Anwar (1971), Eslami et al. (1972), Eslami and Kohneshahri (1978); Jalali (1987, 1992, 1994, 1999). After the 1990s, more records became available on species of fish parasites and in particular on monogeneans, nematodes and myxozoans. Aquaculture in Iran has been developing quickly in recent years and includes the introduction of various new species such as Chinese carp (*Ctenopharyngodon idella*, *Hypophthalmichthys molitrix*, and *Hypophthalmichthys nobilis*), rainbow trout (*Oncorhynchus mykiss*) and new stocks of common carp (*Cyprinus carpio*). Together with this introduction of new species and their associated parasites to Iranian aquaculture there has been translocation of species in the different faunal regions whereby the parasites are also transferred to different parts of the country. In this study, the parasites that have been recorded from different parts of Iran were summarized according to the following; the host species, the organs in which the parasite infestation occurred, the province, the faunal

region and acknowledgement of the original habitat of the infected host fish.

## Materials and methods

The study was done from 2003 to 2011 and to begin with all reported publications about Iranian freshwater fish parasites were collected. The reported publications were classified into four types of document; final reports of research projects, theses, proceedings of congress meetings and seminars and journal publications. For preparing the checklist, if the data were published in a journal, references in other publications were not mentioned. Altogether, 1270 cases of infections were analyzed and 139 of them that were recorded to the species level are summarized in Table 1.

## Results

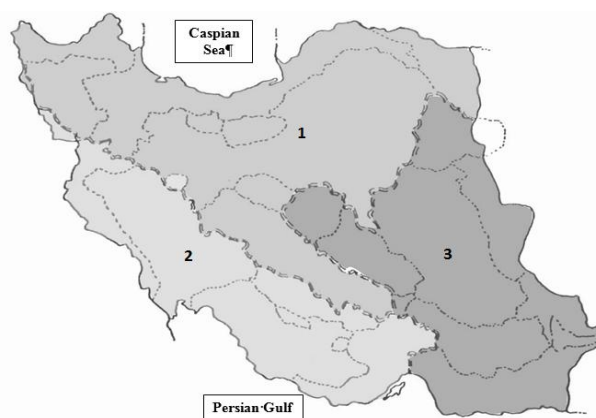
During this study, according to the available data, 247 species of parasites were recorded from 102 fish species (12 families), from different faunal regions. Monogeneans had the most parasites (102 species) followed by myxozoans and nematodes with 40 and 26 different species of parasites, respectively. These parasites, along with details of their host's infected organs, province, faunal region and reference number were summarized in Table 1. The northern part of the country (Ponto-Caspian territory) had the richest parasite fauna with 70 % infections, the southwestern (Mesopotamian) territory followed with 24.5 % and the southeast territory (Indian faunal region) had the lowest with 5.5% of the recorded infections. The most parasites were recorded from Guilan Province (106), and then Mazandaran Province in the Ponto-Caspian territory (87). The most common species of infected fish were *Cyprinus carpio* (29 cases) and different species of *Barbus* spp. (17 cases). Results for other species were as follow; *Capoeta capoeta*, *Capoeta damascina*. (12 cases) and *Hypophthalmichthys molitrix*, *H. nobilis* (12, 9 cases) (Table 1, Fig. 1).

## Discussion

Among the large number of parasites recorded from different parts of the world, research on parasites in Iranian freshwater fish is very new. Many fish parasites from different parts of the country were expected, but only 247

species have been reported so far. The parasites, recorded from the Ponto-Caspian and Indian faunal regions, were similar to those in other countries but some new hosts were reported. Among those recorded from the Mesopotamian part of Iran, some new hosts were reported as well as some endemic and introduced species (Jalali, 1992; Jalali and Molnar 1990, 1996; Jalali et al., 1995, 2000; Masoumian et al., 1994, 1996 a, b, Molnar and Pazooki, 1995; Molnar et al., 1996, Baska and Masoumian, 1996;; Pazooki and Molnar, 1998). The identified new species were: monogeneans (25 species), nematodes (2 species) and myxozoans (10 species). The reported parasites can be classified according to the following different categories: parasites with high host specificity such as *Diplostomum spathaceum* (from 36 fish species in 8 provinces), *Ichthyophthirius multifiliis* (from 25 fish species in 9 provinces), *Hysterothylacium excicus* (from 15 fish species in 4 provinces) *Camallanus sphaerocephalus*, *Psuedocapillaria tomentosa* (from 10 and 7 fish species), *Lernaea cyprinicea* (from 15 fish species in 4 provinces), *Allocreadium pseduspii* (from 11 fish species in 3 provinces) and *Bothrocethallus gowkingensis* (from 9 fish species in 5 provinces) were recorded from different fish of the Caspian Sea and Mesopotamian faunal regions. The host specific species such as *Dactylogyrus extensus* and *Gyrodactylus elegans* (from 9 and 10

Cyprinids fish specimens), *Hexamita salmonis* and *Pleistophora salmoni* were found in the same host (*Salmo gairdneri*) from different faunal regions. Acipenseridae family are endemic in the Caspian Sea area and their parasites were as follows: *Haemogregarina acipenseris*, *Cryptobia acipenseris*, *Diclobothrium armatum*, *Nitzschia sturionis*, *Skrjabinopsolus* spp., *Leptorhynchoides plagicephaly* and, *Pseudotracheliastes stellatus*. The most important host specific parasites were, myxozoans and monogeneans; they were reported from the areas inhabited by their host fish species. Examples of these host specific parasites are as follows: the endemic Barboid fish (*Barbus grypus*, *B. luteus* and *B. sharpeyi*) and their host-specific parasites in the Mesopotamian region. These fish inhabit freshwater in the Mesopotamian intermediate faunal regions of Iran, Iraq, Syria and Turkey. In the Mesopotamian part of Iran, some new parasites were recorded for the first time from the study area. These parasites mainly belong to the genera of *Dactylogyrus*, *Dogielius*, *Philometra* and *Myxobolus* and had probably been introduced to these regions of Iran through the translocation of their hosts. The freshwater habitats in Iran are very unique and they serve as locations for the interaction between fish and their parasites within these three distinct faunal regions. It is expected that species of parasite will vary according to the different regions of the country.



**Figure 1: Iranian freshwater fishes' fauna regions; 1: Ponto-Caspian Territory, 2: Mesopotamian Intermediate Fauna Region, 3: Indian Fauna Region**

**Table 1: Parasites from different part of Iranian freshwater fishes. C.S.: Caspian Sea, I.F.R: Indian Fauna Region, M.: Mesopotamian. A. C.: Abdominal cavity**

No	Parasites	Fishes	Infected organs	Provinces	Fauna region	Ref.
	<b>Ciliophora</b>					
1	<i>Balantidium ctenopharyngodoni</i>	<i>Ctenopharyngodon idella</i>	Intestine	Sistan	I.F.R	118
2	<i>Chilodonella cyprini</i>	<i>Salmo gairdneri</i>	Body surface	Chaharmahal Bakhtiari	C.S.	62
3	<i>Chilodonella hexasitica</i>	<i>Oncorhynchus mykiss</i> , <i>Leuciscus cephalus</i>	Skin	Mazandaran	C. S.	72
4	<i>Ichthyophthirius multifiliis</i>	<i>Acipenser</i> spp., <i>Abramis brama</i> , <i>Alburnoides bipunctatus</i> , <i>Barbus brachycephalus</i> , <i>B. grypus</i> , <i>B. sharpeyi</i> , <i>B. esocinus</i> , <i>B. capito</i> , <i>B. lacerta</i> , <i>B. mursa</i> , <i>Capoeta aculeata</i> , <i>C. capoeta</i> , <i>C. damascina</i> , <i>Carassius auratus</i> , <i>C. carassius</i> , <i>Chalcalburnus sp.</i> , <i>Chondrostoma orientalis</i> , <i>Ch. regium</i> , <i>Ctenopharyngodon idella</i> , <i>Cyprinus carpio</i> , <i>Hypophthalmichthys molitrix</i> , <i>H. nobilis</i> , <i>L. leuciscus</i> , <i>Mastacembelus mastacembelus</i> , <i>Oncorhynchus mykiss</i> , <i>Tinca tinca</i> ,	Body surface, gills	Chaharmahal-Bakhtiari, Esfahan, Fars, Guilan, Khouzestan, Kordestan, Mazandran, Tehran, West Azarbaijan,	C.S., M.,	2, 10, 11, 15, 17, 29, 44, 49, 50, 56, 58, 71, 72, 74, 78, 109, 110, 111, 129, 114, 132, 135
5	<i>Tetrahymena pyriformis</i>	<i>Capoeta capoeta</i>	Skin	West Azerbaijan	C.S.	58
6	<i>Trichodina domerguei</i>	<i>Abramis brama</i> , <i>Alburnoides bipunctatus</i> , <i>Barbus capito</i> , <i>B. lacerta</i> , <i>Capoeta capoeta</i> , <i>Cyprinus carpio</i>	Skin, gills	Guilan	C.S.	78
7	<i>Trichodina perforata</i> ,	<i>Sander lucioperca</i> ,		West Azerbaijan	C.S.	58, 99
8	<i>Trichodina polycolpus</i>	<i>Capoeta capoeta</i>	Fins	West Azerbaijan	C.S.	3
9	<i>Trichodina pediculus</i>	<i>Cyprinus carpio</i> , <i>Capoeta damascina</i> , <i>Mastacembelus mastacembelus</i>	Gills	Chaharmahal-Bakhtiari	C.S.	49
10	<i>Trichodina trutta</i>	<i>Oncorhynchus mykiss</i>	Skin, Fins	Mazandaran	C. S.	72
11	<i>Trichodina reticulata</i>	<i>Acipenser persicus</i>	Skin, Fins	Guilan	C. S.	135
12	<i>Trichodinella subtilis</i>	<i>Capoeta capoeta</i>	Skin	West Azerbaijan	C.S.	71
13	<i>Tripartiella lata</i>	<i>Salmo gairdneri</i>	Skin	West Azerbaijan	C.S.	71
	<b>Mastigophora</b>					
1	<i>Cryptobia acipenseris</i>	<i>Acipenser guldenstaedti</i> , <i>A. persicus</i>	Blood	Guilan	C.S.	93
2	<i>Cryptobia borelli</i>	<i>Salmo gairdneri</i>	Blood	Chaharmahal-Bakhtiari	M.	56
3	<i>Cryptobia branchialis</i>	<i>Hypophthalmichthys molitrix</i>	Blood	Khuzestan	M.	43
4	<i>Cryptobia linchi</i>	<i>Salmo gairdneri</i>	Blood	Chaharmahal-Bakhtiari	C.S.	56
5	<i>Ichthyobodo necator</i>	<i>Carassius auratus</i>	Skin	Guilan	C.S.	5
6	<i>Hexamita salmonis</i>	<i>Salmo gairdneri</i>	Intestine	Chaharmahal-Bakhtiari, Azarbaijan	East C.S.	56, 71
7	<i>Trypanosoma percae</i>	<i>Perca fluviatilis</i> ,	Blood	Guilan	C.S.	43
	<b>Microsporea</b>					
1	<i>Dermocystidium salmonis</i>	<i>Salmo gairdneri</i>	Gills	Chaharmahal-Bakhtiari	C.S.	95
2	<i>Pleistophora salmoni</i>	<i>Salmo gairdneri</i>	Chondrostome Gills, intestine	Chaharmahal-Bakhtiari, Azarbaijan	West C.S.	56, 71
	<b>Apicomplexa</b>					
1	<i>Haemogregarina acipenseris</i>	<i>Acipenser guldenstaedti</i> , <i>A. persicus</i>	blood	Guilan	C.S.	93
2	<i>Goussia carpelli</i>	<i>Cyprinus carpio</i>	Intestine	Guilan	C.S.	43, 72
3	<i>Goussia sinensis</i>	<i>Hypophthalmichthys molitrix</i>	Intestine	Guilan	C.S.	43
	<b>Myxozoa</b>					
1	<i>Myxidium rhodei</i>	<i>Barbus esocinus</i> , <i>B. grypus</i> , <i>B. pectoralis</i> , <i>B. sharpeyi</i> ,	Kidney	Khuzestan	M	63, 129
2	<i>Myxidium pfeifferi</i>	<i>Barbus esocinus</i> , <i>B. grypus</i> , <i>B. pectoralis</i> , <i>B. sharpeyi</i> , <i>Scardinius erythrophthalmus</i>	Gall bladder	Guilan, Khuzestan	C.S.M.	63, 129
3	<i>Myxobolus azerbaijanicus</i>	<i>Barbus mursa</i>	Gills	Mazandaran	C.S.	65
4	<i>Myxobolus bramae</i>	<i>Rutilus frisii kutum</i>	Gills	Mazandaran	C.S.	63
5	<i>Myxobolus buckei</i>	<i>Capoeta damascina</i>	Sinal cord	Kerman	I.F.R	90

6	<i>Myxobolus bulbocordis</i>	<i>Barbus sharpeyi</i>	Heart	Khuzestan	M.	60
7	<i>Myxobolus capito</i>	<i>Barbus capito</i>		Mazandaran	C.S.	65
8	<i>M. karelicus</i>	<i>Capoeta damascina</i>	Intestine	Kerman	M.	90
9	<i>Myxobolus cerebrealis</i>	<i>Salmo gairdneri</i>	Chondrostome	Chaharmahal-Bakhtiari	C.S.	62
10	<i>Myxobolus cristatus</i>	<i>Capoeta capoeta, C.damascina, C. aculeata</i>	Gills	Esfahan, Kerman, West Azarbaijan, Zanjan,	C.S., I.F.R	67, 90, 99, 102
11	<i>Myxobolus dispar</i>	<i>Aspius aspius taeniatus</i>	Gills	Mazandaran	C.S.	66
12	<i>Myxobolus ellipsoides</i>	<i>Alburnoides bipunctatus</i>		Mazandaran	C.S.	63
13	<i>Myxobolus iranicus</i>	<i>Barbus grypus, B. luteus, B. sharpeyi</i>	Spleen	Khuzestan	M.	85
14	<i>Myxobolus karuni</i>	<i>Barbus esocinus, B. barbulus B. grypus, B. luteus, B. sharpeyi, B. pectoralis,</i>	Gills	Khuzestan	M.	60, 64, 68, 129
15	<i>Myxobolus kovali</i>	<i>Barbus lacerta, B. mursa</i>	Gills	Mazandaran	C.S.	60, 64
16	<i>Myxobolus lobatus</i>	<i>Barbus brachycephalus, Cyprinus carpio</i>	Skin, Gills,	Guilan	C.S.	78
17	<i>Myxobolus mesopotamiae</i>	<i>Barbus grypus, B. luteus, B. rajanorum, B. pectoralis</i>	Fins	Khuzestan	M.	64, 85, 129
18	<i>Myxobolus minutus</i>	<i>Barbus capito, Leuciscus cephalus</i>	Muscle, Gills	Mazandaran	C.S.	63
19	<i>Myxobolus mokhayeri</i>	<i>Capoeta trutta</i>	Fins	Khuzestan	M.	12, 64
20	<i>Myxobolus molnari</i>	<i>Capoeta trutta, Chalcalburnus sp.</i>	Gills	Chaharmahal-Bakhtiari, Khuzestan	C.S.M.	12, 64, 49
21	<i>Myxobolus muelleri</i>	<i>Leuciscus cephalus</i>	Muscle	Mazandaran	C.S.	63
22	<i>Myxobolus musayevi</i>	<i>Capoeta capoeta, C.damascina, C. aculeata</i>	Gills	Chaharmahal-Bakhtiari, Esfahan Kerman, West-Azarbaijan, Zanjan	C.S, I.F.R	50, 62, 67, 90, 99, 102, 110, 111
23	<i>Myxobolus musculi</i>	<i>Barbus capito</i>	Muscle	Mazandaran	C.S.	65
24	<i>Myxobolus nodulointestinalis</i>	<i>Barbus luteus, B. sharpeyi, B. pectoralis</i>	Intestine	Khuzestan	M.	64, 129
25	<i>Myxobolus osmaniae</i>	<i>Barbus mursa</i>	Intestine	Mazandaran	C.S.	65
26	<i>Myxobolus pavlovskiy</i>	<i>Hypophthalmichthys molitrix</i>	Gills	Mazandaran	C.S.	63
27	<i>Myxobolus persicus</i>	<i>Barbus esocinus, B. barbulus B. grypus, B. luteus, B. sharpeyi, Barbus pectoralis,</i>	Gills	Khuzestan	M.	68, 64, 60, 129
29	<i>Myxobolus pseudodispar</i>	<i>Chalcalburnus chalcoides</i>	Gills	Guilan	C.S.	63
30	<i>Myxobolus rutili</i>	<i>Barbus mursa</i>	Gills	Mazandaran	C.S.	65
31	<i>Myxobolus saidovi</i>	<i>Capoeta capoeta, Alburnus sp.,</i>	Gills	Esfahan, Mazandaran	C. S.	67, 72
32	<i>Myxobolus samgoricus</i>	<i>Capoeta capoeta, C.damascina</i>	Fins	Esfahan, Kerman, Mazandaran	C.S, I.F.R	50, 64, 67, 90
33	<i>Myxobolus schulmani</i>	<i>Tinca tinca</i>	Fins	Guilan	C.S.	18
34	<i>Myxobolus shadgani</i>	<i>Barbus rajanorum</i>	Gills	Khuzestan	M.	85
35	<i>Myxobolus sharpeyi</i>	<i>Barbus sharpeyi</i>	Gills arch	Khuzestan	M.	85
36	<i>Myxobolus squamae</i>	<i>Barbus mursa</i>	Skin	Mazandaran	C.S.	65
37	<i>M. suturalis</i>	<i>Capoeta damascina</i>	Heart	Kerman	I.F.R	90
38	<i>Myxobolus tauricus</i>	<i>Barbus mursa</i>	Fins	Mazandaran	C.S.	65
39	<i>Myxobolus valdogeli</i>	<i>Barbus lacerta</i>	Gills	Mazandaran	C.S.	65
40	<i>M. varicorhini</i>	<i>Capoeta damascina</i>	Skin,	Esfahan, Kerman	C.S, I.F.R	50, 67, 90
	<b>Monogenea</b>					
1	<i>Ancyrocephalus paradoxus</i>	<i>Sander lucioperca</i>	Gills	Guilan	C.S.	24, 46
2	<i>Ancyrodiscoides fluviatilis</i>	<i>Mugil abzarudni</i>	Gills	Khuzestan	M.	43
3	<i>Aphanurus stossichi</i>	<i>Parasilurus triostegus</i>	Gills	Guilan	C.S.	43
4	<i>Dactylogyrus holciki</i>	<i>Chalcalburnus chalcoides</i>	Gills	Khuzestan	M.	84
5	<i>Dactylogyrus langicopula</i>	<i>Schizocypris zarudnyi</i>	Gills	Sistan	I.F.R	47
6	<i>Dactylogyrus achmerowi</i>	<i>Cyprinus carpio</i>	Gills	Guilan	C.S.	2
7	<i>Dactylogyrus acinacus</i>	<i>Garra rufa</i>	Gills	Sistan	I.F.R	37
8	<i>Dactylogyrus affinis</i>	<i>Barbus brachycephalus</i>	Gills	Guilan	C.S.	84
9	<i>Dactylogyrus alatus</i>	<i>Alburnoides bipunctatus, Alburnus charusini, A. maculatus, C. mossulensis, Chalcalburnus</i>	Gills	Chaharmahal- Bakhtiari, Esfahan,	I.F.R C.S. M.	45, 44, 49, 70, 84 ,

		<i>chalcoides</i> , <i>Chalcalburnus</i> sp.		Guilan, Kordestan		108
10	<i>Dactylogyrus anchoratus</i>	<i>Barbus sharpeyi</i> , <i>Carassius auratus</i> , <i>C. carassius</i> , <i>Cyprinus carpio</i>	Gills	Fars, Guilan, Khouzestan, Tehran	C.S. M.	2, 5, 7, 10, 42, 45, 137
11	<i>Dactylogyrus aristichthys</i>	<i>Hypophthalmichthys nobilis</i>	Gills	Guilan, Kordestan	C.S.	2, 44, 46
12	<i>Dactylogyrus barboides</i>	<i>Barbus grypus</i> , <i>B. sharpeyi</i>	Gills	Khouzestan	M.	137
13	<i>Dactylogyrus barbuli</i>	<i>Barbus barbuli</i>	Gills	Khouzestan	M.	43
14	<i>Dactylogyrus baueri</i>	<i>Alburnoides bipunctatus</i> , <i>Carassius auratus</i> , <i>C. carassius</i>	Gills	Esfahan, Guilan, Mazandaran, Tehran	C.S.	2, 5, 7, 45, 70, 133
15	<i>Dactylogyrus bychowskyi</i>	<i>Barbus brachycephalus</i>	Gills	Guilan	C.S.	84
16	<i>Dactylogyrus capoeta</i>	<i>Capoeta damascina</i>	Gills	Khouzestan	M.	47
17	<i>Dactylogyrus carassobarbi</i>	<i>Barbus sharpeyi</i> , <i>Capoeta damascina</i>	Gills	Chaharmahal- Bakhtiari, Khouzestan	C.S. M.	49, 137
18	<i>Dactylogyrus carpathicus</i>	<i>Barbus plebejus</i>	Gills	Guilan	C.S.	84
19	<i>Dactylogyrus chalcalburni</i>	<i>Alburnoides</i> , <i>bipunctatus</i> , <i>Alburnus alburnus</i> , <i>A. charusini</i> , <i>Chalcalburnus chalcoides</i>	Gills	Esfahan, Guilan	C.S.	2, 7, 46, 70, 84
20	<i>Dactylogyrus chramulii</i>	<i>Abramis brama</i> , <i>Capoeta capoeta</i> , <i>Cyprinus carpio</i> , <i>Rutilus rutilus</i>	Gills	Esfahan, Guilan, Mazandaran, West Azarbaijan	C.S.	30, 70, 84, 103
21	<i>Dactylogyrus cornoides</i>	<i>Vimba vimba persa</i>	Gills	Guilan	C.S.	46
22	<i>Dactylogyrus ctenopharyngodonis</i>	<i>Ctenopharyngodon idella</i>	Gills	Guilan	C.S.	2
23	<i>Dactylogyrus cyprinioni</i>	<i>Cyprinion macrostomum</i>	Gills	Khouzestan	M.	42
24	<i>Dactylogyrus deziensoides</i>	<i>Barbus kersin</i>	Gills	Khouzestan	M.	36
25	<i>Dactylogyrus deziensis</i>	<i>Barbus kersin</i>	Gills	Khouzestan	M.	36
26	<i>Dactylogyrus djomansajensis</i>	<i>Barbus capito</i>	Gills	Guilan	M.	2
27	<i>Dactylogyrus dulkeiti</i>	<i>Carassius auratus</i> , <i>C. arassius</i> , <i>Cyprinus carpio</i>	Gills	Guilan, Tehran	C.S.	5, 7, 42, 44
28	<i>Dactylogyrus eslamii</i>	<i>Crossocheilus latius</i>	Gills	Sistan	I.F.R	20
29	<i>Dactylogyrus extensus</i>	<i>Alburnus alburnus</i> , <i>Abramis brama</i> , <i>Albornoides bipunctatus</i> , <i>Carassius auratus</i> , <i>Capoeta aculeate</i> , <i>C. capoeta</i> , <i>Chondrostoma regium</i> , <i>Cyprinus carpio</i> , <i>Rutilus rutilus</i>	Gills	Chaharmahal- Bakhtiari, Esfahan, Fars, Guilan, Kordestan, Tehran	C.S., M.	7, 10, 29, 44, 46, 49, 53, 56, 70, 108, 109, 111
30	<i>Dactylogyrus faridpaki</i>	<i>Crossocheilus latius</i>	Gills	Sistan	I.F.R	22
31	<i>Dactylogyrus formosus</i>	<i>Barbus mursa</i> , <i>Carassius auratus</i> , <i>C. carassius</i>	Gills	Guilan, Mazandaran, Tehran	C.S	5, 7, 46, 133
32	<i>Dactylogyrus frisii</i>	<i>Rutilus frisii kutum</i>	Gills	Guilan, Mazandaran	C.S.	45, 89
33	<i>Dactylogyrus goktschaicus</i>	<i>Barbus lacerta</i> , <i>Barbus cyclolepis</i>	Gills	Chaharmahal- Bakhtiari, Mazandaran	C.S.	29, 49
34	<i>Dactylogyrus gracilis</i>	<i>Capoeta aculeate</i> , <i>C. capoeta</i>	Gills	Esfahan, Guilan, Zanjan	C.S.	29, 70, 84
35	<i>Dactylogyrus haplogonus</i>	<i>Rutilus frisii kutum</i> , <i>Vimba vimba</i>	Gills	Guilan	C.S.	2, 41, 45, 89
36	<i>Dactylogyrus hypophthalmichthys</i>	<i>Hypophthalmichthys molitrix</i> , <i>H. nobilis</i>	Gills	Chaharmahal- Bakhtiari, Guilan, Kordestan, Mazandaran, Tehran	C.S. M.	2, 7, 42, 44, 45, 49
37	<i>Dactylogyrus intermedius</i>	<i>Carassius auratus</i>	Gills	Tehran	C.S	36, 84
38	<i>Dactylogyrus inutilis</i>	<i>Barbus xanthopterus</i>	Gills	Khouzestan	M.	43
39	<i>Dactylogyrus jamansajensis</i>	<i>Barbus lacerta</i>	Gills	Guilan	C.S.	43
40	<i>Dactylogyrus kersini</i>	<i>Barbus kersin</i> , <i>Capoeta trutta</i>	Gills	Khouzestan, Kordestan	M.	37, 44
41	<i>Dactylogyrus lamellatus</i>	<i>Ctenopharyngodon idella</i>	Gills	Chaharmahal- Bakhtiari, Esfahan, Fars, Guilan, Kordestan, Tehran, Zanjan	C.S. M,	2, 7, 10, 29, 31, 42, 44, 49, 50, 108, 109
42	<i>Dactylogyrus lenkorani</i>	<i>Abramis brama</i> , <i>Albornoides bipunctatus</i> , <i>Capoeta aculeata</i> , <i>C. capoeta</i> , <i>C. damascina</i> , <i>C. trutta</i> , <i>Carassius carassius</i> , <i>Cyprinus carpio</i> ,	Gills	Chaharmahal- Bakhtiari, Esfahan, Fars, Guilan, Kordestan, Tehran, West Azarbaijan	C.S. M.	2, 10, 29, 31, 42, 44, 49, 70, 84, 103, 110, 111
43	<i>Dactylogyrus linstowi</i>	<i>Barbus capito</i> , <i>B. cyclolepis</i> , <i>B. mursa</i> , <i>B. plebejus</i> , <i>Capoeta damascina</i>	Gills	Guilan, Kordestan, Mazandaran	C.S., M.	44, 74, 84, 133.
44	<i>Dactylogyrus macrostomi</i>	<i>Cyprinion macrostomum</i>	Gills	Khouzestan	M.	43
45	<i>Dactylogyrus microcanthus</i>	<i>Leusciscus cephalus</i>	Gills	Guilan, Mazandaran	C.S.	43
46	<i>Dactylogyrus microcirrus</i>	<i>Capoeta trutta</i>	Gills	Khouzestan	M.	36
47	<i>Dactylogyrus minor</i>	<i>Alburnus filippi</i> , <i>Chalcalburnus chalcoides</i> , <i>Leusciscus lepidus</i>	Gills	Kordestan, Esfahan	C.S. M.	50, 84

48	<i>Dactylogyrus mobedii</i>	<i>Aspidoparia morar</i>	Gills	Sistan	IFR	48
49	<i>Dactylogyrus nobilis</i>	<i>Hypophthalmichthys nobilis</i>	Gills	Guilan, Mazandaran	C.S.	2 45
50	<i>Dactylogyrus nybelini</i>	<i>Rutilus frisii kutum</i>	Gills	Guilan	C.S.	84
51	<i>Dactylogyrus orbus</i>	<i>Bertinius subquincanciatius</i>	Gills	Khouzestan	M.	43
52	<i>Dactylogyrus pallicirrus</i>	<i>Cyprinion watsoni</i> , <i>C. macrostomum</i>	Gills	Khouzestan	M.	47
53	<i>Dactylogyrus parvus</i>	<i>Alburnus charusini</i>	Gills	Guilan	C.S.	84
54	<i>Dactylogyrus persicus</i>	<i>Barbus grypus</i> , <i>B. luteus</i>	Gills	Khouzestan	M.	43, 137
55	<i>Dactylogyrus pavlowskyi</i>	<i>Barbus grypus</i> , <i>B. sharpeyi</i>	Gills	Khouzestan	M.	37, 137
56	<i>Dactylogyrus prostaе</i>	<i>Leusiscus cephalus</i>	Gills	Mazandarn	C.S.	45
57	<i>Dactylogyrus pulcher</i>	<i>Alburnoides bipunctatus</i> , <i>Aspius vorax</i> , <i>Capoeta capoeta</i> , <i>C. damascina</i> , <i>C. trutta</i>	Gills	Chaharmahal- Bakhtiari, Esfahan, Guilan, Kordestan, Mazandarn, Tehran	C.S. M.	26, 29, 37, 42, 44, 70, 84, 110
58	<i>Dactylogyrus rarissimus</i>	<i>Rutilus frisii kutum</i>	Gills	Guilan, Mazandarn	C.S.	45
59	<i>Dactylogyrus rectotrabus</i>	<i>Garra rufa</i>	Gills	Khouzestan	M.	37
60	<i>Dactylogyrus rohdeianus</i>	<i>Capoeta damascina</i>	Gills	Khouzestan	M.	47
61	<i>Dactylogyrus sahuensis</i>	<i>Cyprinus carpio</i>	Gills	Guilan	C.S.	45
62	<i>Dactylogyrus schizocypris</i>	<i>Schizocypris brucei</i>	Gills	Sistan		47
63	<i>Dactylogyrus spiralis</i>	<i>Cyprinus carpio</i>	Gills	Chaharmahal- Bakhtiari	C.S.	108, 109
64	<i>Dactylogyrus sphyrnae</i>	<i>Alburnus alburnus</i> , <i>Leusiscus persidis</i>	Gills	East Azarbaijan, Fars	C.S.	10, 31
65	<i>Dactylogyrus suecicus</i>	<i>Rutilus frisii kutum</i>	Gills	Guilan	C.S.	84, 89
66	<i>Dactylogyrus suchengtaii</i>	<i>Hypophthalmichthys molitrix</i>	Gills	Chaharmahal-Bakhtiari	C.S.	49
67	<i>Dactylogyrus tuba</i>	<i>Aspius aspius</i>	Gills	Guilan	C.S.	84
68	<i>Dactylogyrus turaliensis</i>	<i>Rutilus frisii kutum</i> , <i>R. rutilus</i>	Gills	Guilan, Mazandaran	C.S.	36, 66, 84, 89
69	<i>Dactylogyrus vastator</i>	<i>Barbus brachycephalus</i> , <i>Capoeta capoeta</i> , <i>Carassius auratus</i> , <i>C. carassius</i> , <i>Cyprinus carpio</i> , <i>Vimba vimba persa</i>	Gills	Guilan, Esfahan, Khouzestan Mazandaran, Tehran	C.S.	15, 76, 99, 107, 118
70	<i>Dactylogyrus vistulae</i>	<i>Alburnoides bipunctatus</i> , <i>Alburnus filippi</i> , <i>Capoeta capoeta</i> , <i>Chalcalburnus chalcoides</i> , <i>Leusiscus cephalus</i>	Gills	Esfahan, Guilan, Mazandaran	C.S.	29, 31, 78, 133
71	<i>Dactylogyrus wegneri</i>	<i>Carassius auratus</i>	Gills	Guilan, Tehran	C.S.	5
72	<i>Dactylogyrus wunderi</i>	<i>Abramis brama</i>	Gills	Guilan	C.S.	2
73	<i>Dactylogyrus yousefpouri</i>	<i>Aspidoparia morar</i>	Gills	Sistan	IFR	48
74	<i>Dactylogyrus zandii</i>	<i>Abramis brama</i>	Gills	Guilan	C.S.	2, 36
75	<i>Diclobothrium armatum</i>	<i>Acipenser persicus</i> , <i>A. guldenstaedti</i> , <i>A. nudiventris</i> , <i>A. stellatus</i> , <i>A. stellatus</i> , <i>Huso huso</i>	Gills	Guilan, Mazandaran	C.S.	38, 107, 135
76	<i>Diplozoon paradoxum</i>	<i>Aspius vorax</i> , <i>Carassius auratus</i> , <i>Cyprinus carpio</i> , <i>Rutilus frisii kutum</i>	Gills	Guilan, Khouzestan, Mazandaran, West Azarbaijan	M. C.S.	5, 19, 74, 120
77	<i>Dogielius mokhayeri</i>	<i>Aspius vorax</i>	Gills	Khouzestan	M.	45
78	<i>Dogielius molnari</i>	<i>Cyprinion macrostomum</i> , <i>Capoeta damascina</i>	Gills	Chaharmahal-Bakhtiari, Khouzestan, Kordestan	M. C.S.	42, 49
79	<i>Dogielius persicus</i>	<i>Barbus sharpeyi</i>	Gills	Khouzestan	M.	136
80	<i>Gyrodactylus fossilis</i>	<i>Heteropneus fossilis</i>	Gills	Khouzestan	M.	47
81	<i>Gyrodactylus cyprini</i>	<i>Cyprinus carpio</i>	Gills	Guilan	C.S.	47
82	<i>Gyrodactylus derjavini</i>	<i>Oncorhynchus mykiss</i>	Gills	Mazandaran	C.S.	47, 72
83	<i>Gyrodactylus elegans</i>	<i>Abramis brama</i> , <i>Capoeta gracilis</i> , <i>Carassius carassius</i> , <i>Chalcalburnus chalcoides</i> , <i>Ctenopharyngodon idella</i> , <i>Cyprinus carpio</i> , <i>Esox lucius</i> , <i>Hypophthalmichthys molitrix</i> , <i>Perca fluviatilis</i> , <i>Tinca tinca</i>	Gills	Guilan	C.S.	47, 77, 87, 98
84	<i>Gyrodactylus kobayashii</i>	<i>Carassius auratus</i>	Gills	Guilan, Tehran	C.S.	5
85	<i>Gyrodactylus mutabilis</i>	<i>Capoeta capoeta</i>	Gills	Esfahan	C.S.	50
86	<i>Gyrodactylus prostaе</i>	<i>Carassius auratus</i> , <i>Rutilus frisii kutum</i>	Gills	Guilan	C.S.	47, 89
87	<i>Gyrodactylus shulmani</i>	<i>Cyprinus carpio</i>	Gills	Guilan	C.S.	47
88	<i>Gyrodactylus sprostonae</i>	<i>Cyprinus carpio</i> , <i>Hypophthalmichthys molitrix</i> , <i>H. nobilis</i>	Gills	Guilan	C.S.	47

89	<i>Gyrodactylus stankovici</i>	<i>Cyprinus carpio</i>	Gills	Chaharmahal-Bakhtiari, Guilan	C.S.	47, 49
90	<i>Mastacembelocleidus heteranchorus</i>	<i>Mastacembelus mastacembelus</i>	Gills	Chaharmahal-Bakhtiari	C.S.	49
91	<i>Mazocraes alosae</i>	<i>Chalcalburnus tarishi</i>	Gills	Guilan	C.S.	8
92	<i>Microcotyle mugilis</i>	<i>Liza abu</i>	Gills	Khouzestan	M.	43
93	<i>Nitzschia sturionis</i>	<i>Acipenser persicus</i> . <i>A. guldenstaedti</i> . <i>A. nudiventris</i> . <i>A. stellatus</i> . <i>Huso huso</i>	Gills. A.C.	Guilan, Mazandaran	C.S.	38, 28, 78, 107, 135
94	<i>Octomacrum europaeum</i>	<i>Alburnoides bipunctatus</i>	Gills	Mazandaran	C.S.	133
95	<i>Paradiplozoon chazarikum</i>	<i>Rutilus frisii kutum</i>	Gills	Mazandaran	C.S.	43
96	<i>Paradiplozoon homion</i>	<i>Barbus lacerta</i> . <i>B. mursa</i>	Gills	Mazandaran	C.S.	98
97	<i>Paradiplozoon tadzikistanicum</i>	<i>Barbus lacerta</i> . <i>Capoeta capoeta</i>	Gills	West Azarbaijan	C.S.	73
98	<i>Paradiplozoon chazarikum</i>	<i>Rutilus frisii kutum</i>	Gills	Guilan	C.S.	55
99	<i>Saccocoelium obesum</i>	<i>Mugil auratus</i> . <i>Mugilidae</i> sp.	Gills	East Azarbaijan, Mazandaran	C.S.	88, 119
100	<i>Silurodiscoides siluri</i>	<i>Silurus glanis</i>	Gills	Guilan	C.S.	43
101	<i>Silurodiscoides vistulensis</i>	<i>Silurus glanis</i>	Gills	Guilan	C.S.	43
102	<i>Tetraonchus monteron</i>	<i>Cyprinus carpio</i> . <i>Esox lucius</i>	Gills	Guilan, Mazandaran	C.S.	72, 82, 125
	<b>Digenea</b>					
1	<i>Allocreadium laymani</i>	<i>Capoeta capoeta</i> . <i>C. damascina</i>	Intestine	Chaharmahal-Bakhtiari, Esfahan	C.S.	50, 110
2	<i>Allocreadium isoporum</i>	<i>Alburnoides bipunctatus</i> . <i>Alburnus filippi</i> . <i>Aphanius vladkovi</i> . <i>Barbus lacerta</i> . <i>Capoeta aculeata</i> . <i>C. capoeta</i> . <i>C. damascina</i> . <i>Cobitis taenia</i> . <i>Leusiscus lepidus</i>	Intestine	Chaharmahal-Bakhtiari, Esfahan, Mazandaran, West Azarbaijan	C.S.	1, 29, 98, 50, 110, 102, 112, 133, 138
3	<i>Allocreadium polymorphum</i>	<i>Barbus capito</i>	Intestine	Guilan	C.S.	78
4	<i>Allocreadium pseudaspis</i>	<i>Alburnoides bipunctatus</i> . <i>Aphanius vladkovi</i> . <i>Barbus capito</i> . <i>B. lacerta</i> . <i>B. mursa</i> . <i>B. plebejus</i> . <i>Capoeta capoeta</i> . <i>C. damascina</i> . <i>Leusiscus cephalus</i> . <i>Cobitis taenia</i> . <i>Nemacheilus malapterurus</i>	Intestine	Chaharmahal-Bakhtiari, Mazandaran, West Azarbaijan	C.S.	101, 112, 133
5	<i>Allocreadium transversale</i>	<i>Cobitis taenia</i>	Intestine	Mazandaran	C.S.	133
6	<i>Aphanurus stossichi</i>	<i>Silurus glanis</i>	intestine	Guilan		133
7	<i>Asymphyiodora demeli</i>	<i>Barbus capito</i> . <i>B. lacerta</i> . <i>B. mursa</i> . <i>Capoeta capoeta</i>	intestine	West Azarbaijan	C.S.	132
8	<i>Asymphyiodora kubanicum</i>	<i>Rutilus frisii kutum</i> . <i>Vimba vimba</i>	Digestiv e tract	Guilan, Mazandaran	C.S.	24, 55, 96
9	<i>Asymphyiodora macracetabulum</i>	<i>Barbus capito</i> . <i>B. mursa</i> . <i>Rutilus frisii kutum</i> . <i>Tinca tinca</i> .	Intestine. Digestiv e tract	West Azarbaijan, Mazandaran, Guilan	C.S.	26, 81, 101, 120
10	<i>Asymphyiodora tincae</i>	<i>Barbus capito</i> . <i>B. mursa</i> . <i>Chalcalburnus tarishi</i> . <i>Esox lucius</i> . <i>Rutilus rutilus</i> . <i>Tinca tinca</i> .	Intestine. Digestiv e tract	West Azarbaijan, Guilan	C.S.	24, 41, 44, 89, 93
11	<i>Asymphyiodora workewitsdi</i>	<i>Barbus capito</i> . <i>B. mursa</i>	intestine	West Azarbaijan	C.S.	101
12	<i>Bunocotyle cingulata</i>	<i>Clupeonella cultriventris</i> . <i>C. grimmi</i> . <i>Capoeta capoeta</i> . <i>Silurus glanis</i>	Intestine	Guilan, Mazandaran	C.S.	132, 133
13	<i>Clinostomum complanatum</i>	<i>Alburnoides bipunctatus</i> . <i>Capoeta capoeta</i> . <i>C. c. gracilis</i> . <i>Chalcalburnus chalcoides</i> . <i>Leusiscus cephalus</i> . <i>Neogobius luviatilis</i> . <i>Cobitis taenia</i>	Skin. Muscles . gills	Mazandaran, Teharn, West Azarbaijan	C.S.	57, 81, 116, 130, 133
14	<i>Diplostomum spathaceum</i>	<i>Acipenser guldenstaedti</i> . <i>A. nudiventris</i> . <i>A. persicus</i> . <i>A. stellatus</i> . <i>Abramis brama</i> . <i>A. charusini</i> . <i>Alburnoides bipunctatus</i> . <i>Alburnus alburnus</i> . <i>Alosa caspia persica</i> . <i>Aphanius vladkovi</i> . <i>Barbus lacerta</i> . <i>B. mursa</i> . <i>Barbus capito</i> . <i>Blicca bjuerkna</i> . <i>Capoeta aculeate</i> . <i>C. capoeta</i> . <i>C. damascina</i> . <i>Carassius auratus</i> . <i>C. carassius</i> . <i>Ctenopharyngodon idella</i> . <i>Chondrostoma orientalis</i> . <i>Chondrostoma regium</i> . <i>Cyprinus carpio</i> . <i>Esox lucius</i> . <i>Hypophthalmichthys molitrix</i> . <i>H. nobilis</i> . <i>Leuciscus cephalus</i> . <i>L. lepidus</i> . <i>Lucioperca lucioperca</i> . <i>Mastacembelus mastacembelus</i> . <i>Neogobius fluviatilis</i> . <i>Oncorhynchus mykiss</i> . <i>Rutilus frisii kutum</i> . <i>R. rutilus</i> . <i>Scardinius erythrophthalmus</i> . <i>Tinca tinca</i>	Eyes	Chaharmahal-Bakhtiari, Esfahan, Fars, Gilan, Khouzestan, Kordestan, Mazandaran, West Azarbaijan	C.S. M.	7, 10, 11, 13, 14, 15, 16, 18, 29, 32, 38, 49, 50, 52, 53, 54, 55, 66, 73, 81, 87, 91, 101, 102, 106, 108, 111, 112, 114, 117, 126, 122, 133
15	<i>Tylodelphys clavata</i>	<i>Alburnus alburnus</i> . <i>Carassius auratus</i> . <i>Capoeta aculeate</i> . <i>Chondrostoma regium</i> . <i>Ctenopharyngodon idella</i> . <i>Cyprinus carpio</i> . <i>Hypophthalmichthys molitrix</i> .	Eyes	Chaharmahal-Bakhtiari	C.S.	11, 108, 111
16	<i>Posthodiplostomum cuticola</i>	<i>Barbus brachycephalus</i>	Skin	Guilan	C.S.	78
17	<i>Skrjabinopsolus acipenseris</i>	<i>Huso huso</i>	Digestiv e tract	Guilan, Mazandaran	C.S.	77, 82



18	<i>Skrjabinopsolus semiarmatus</i>	<i>Acipenser guldenstaedtii</i> . <i>A. nudiventris</i> . <i>A. persicus</i> <i>A. stellatus</i> . <i>Huso huso</i>	Intestine, Digestive tract	Guilan, Mazandaran	C.S.	14, 33, 34, 69, 77, 82, 120, 123
19	<i>Skrjabinopsolus skrjabini</i>	<i>Huso huso</i>	Digestive tract	Guilan, Mazandaran	C.S.	32, 34
<b>Cestoda</b>						
1	<i>Bothrimonus fallax</i>	<i>Acipenser stellatus</i> . <i>Huso huso</i>	Digestive tract	Guilan, Mazandaran	C.S.	34, 77
2	<i>Bothriocephalus acheilognathi</i>	<i>Alburnus filippi</i> . <i>Cyprinus carpio</i>	Intestine	East Azarbaijan	C.S.	88, 105
3	<i>Bothriocephalus gowkongensis</i>	<i>Barbus brachycephalus</i> . <i>B. capito</i> . <i>B. lacerta</i> . <i>B. mursa</i> . <i>Capoeta damascina</i> . <i>Chalcalburnus chalchoides</i> <i>Chondrostoma regium</i> , <i>Ctenopharyngodon idella</i> . <i>Cypinus carpio</i> . <i>Rutilus rutilus</i>	Digestive tract	Chaharmahal-Bakhtirari, Guilan, Khouzestan, Mazandaran, West Azarbaijan	C.S. M.	5, 6, 9, 66, 76, 78, 108, 119
4	<i>Bothriocephalus opsariichthydis</i>	<i>Barbus luteus</i> <i>Ctenopharyngodon idella</i> . <i>Cyprinus carpio</i> . <i>Nemacheilus</i> sp.	Digestive tract	Khouzestan, West Azarbaijan	C.S. M.	73, 136
5	<i>Caryophyllaeus brachycollis</i>	<i>Cyprinus carpio</i>	Digestive tract	Mazandaran, Guilan		119, 120
6	<i>Caryophyllaeus fimbriceps</i>	<i>Abramis brama</i> . <i>Cyprinus carpio</i> . <i>Mugilidae</i> sp.. <i>Rutilus rutilus</i> . <i>Tinca tinca</i> .	Intestine	Guilan, Mazandaran	C.S.	25, 53, 78, 120
7	<i>Caryophyllaeus laticeps</i>	<i>Abramis brama</i> . <i>Cyprinus carpio</i>	A. C.	West Azarbaijan, Mazandaran, Guilan	C.S.	1, 119, 120, 102
8	<i>Diphyllobothrium latum</i>	<i>Barbus brachycephalus</i> . <i>Barbus</i> sp.	A. C.	Guilan, Esfahan	C.S.	78
9	<i>Eubothrium acipenserinum</i>	<i>Acipenser guldenstaedtii</i> . <i>A. nudiventris</i> . <i>A. persicus</i> . <i>A. stellatus</i> . <i>Huso huso</i>	Digestive tract	Mazandaran, Guilan	C.S.	77, 124, 14, 120, 69, 34
10	<i>Khawia armenica</i>	<i>Capoeta buhsei</i> . <i>Capoeta capoeta</i>	Digestive tract	Esfahan	C.S.	50, 138
11	<i>Ligula intestinalis</i>	<i>Abramis brama</i> . <i>Alburnoides bipunctatus</i> . <i>Alburnus atropatanea</i> . <i>A. charusini</i> . <i>A. filippi</i> . <i>Barbus</i> sp.. <i>Capoeta capoeta</i> . <i>Carassius auratus</i> . <i>Chalcalburnus</i> sp. <i>Cyprinus carpio</i>	A. C.	Chaharmahal-Bakhtirari, East Azarbaijan, Khorasan, Mazandaran, West Azarbaijan	C.S. M.	1, 3, 49, 73, 88, 102, 115
12	<i>Schistocephalus solidus</i>	<i>Barbus</i> sp.	A. C.	Esfahan	C.S.	115
13	<i>Triaenophorus crassus</i>	<i>Esox lucius</i>	Digestive tract	Guilan, Mazandaran	C.S.	53, 82, 119
<b>Nematoda</b>						
1	<i>Anguicola crassus</i>	<i>Anguilla anguilla</i>	Swim-bladder	Fars	M.	4
2	<i>Anisakis schupakovi</i>	<i>Silurus glanis</i> . <i>Acipenser guldenstaedtii</i>	Intestine, liver	Guilan	C.S.	98
3	<i>Ascarophis ovotrichuria</i>	<i>Acipenser guldenstaedtii</i>	Intestine	Guilan	C.S.	98
4	<i>Camallanus lucustris</i>	<i>Barbus luteus</i> . <i>B. sharpeyi</i> . <i>Capoeta capoeta</i> . <i>Esox lucius</i> <i>Tinca tinca</i>	Digestive tract	Guilan, Khouzestan, West Azarbaijan.	C.S. M.	53, 74, 101
5	<i>Contracecum osculatum</i>	<i>Esox lucius</i>	A. C.	Mazandaran	C.S.	24
6	<i>Contracecum spiculigerum</i>	<i>Mugilidae</i> sp.		Mazandaran	C.S.	119
7	<i>Contracecum squallii</i>	<i>Acipenser guldenstaedtii</i>	Liver	Guilan, Mazandaran	C.S.	98, 82
8	<i>Cucullanus criatus</i>	<i>Barbus grypus</i>	Intestine	Khouzestan	M.	74
9	<i>Cucullanus mulleri</i>	<i>Carassius auratus</i>	Intestine	Mazandaran	C.S.	97
10	<i>Cucullanus sphaerocephalus</i>	<i>Acipenser guldenstaedtii</i> . <i>A. nudiventris</i> <i>A. persicus</i> . <i>A. stellatus</i> . <i>Huso huso</i> . <i>Neogobius bathybius</i> . <i>N. fluviatilis pallasi</i> . <i>N. kessleri gorlap</i> . <i>N. melanostomus</i> . <i>Silurus glanis</i>	Intestine	Guilan, Mazandaran, Gorgan	C.S.	14, 32, 69, 82, 98, 104, 120, 124, 132
11	<i>Cyclozoon acipenserina</i>	<i>Acipenser guldenstaedtii</i> . <i>A. stellatus</i>	Intestine	Guilan, Mazandaran	C.S.	98, 82, 38
12	<i>Cystoopsis acipenseris</i>	<i>Acipenser guldenstaedtii</i> . <i>A. persicus</i>	A. C.	Mazandaran	C.S.	38
13	<i>Dichelyne minutus</i>	<i>Neogobius fluviatilis</i> . <i>N. kessleri</i>	Intestine	Mazandaran, Gorgan	C.S.	95, 104
14	<i>Eustrongilides excisus</i>	<i>Aspius aspius</i> . <i>Acipenser persicus</i> . <i>A. stellatus</i> . <i>A. nudiventris</i> . <i>A. guldenstaedtii</i> . <i>Barbus capito</i> . <i>Carassius carassius</i> . <i>Clupeonella grimmi</i> . <i>Esox lucius</i> . <i>Huso huso</i> . <i>Neogobius bathybius</i> . <i>N. fluviatilis</i> . <i>N. caspius</i> . <i>N. kessleri gorlap</i> . <i>Perca fluviatilis</i> .	Abdominal cavity, ovary, testis, muscles	Gorgan, Guilan, Mazandaran, West Azarbaijan	C.S.	53, 98, 102, 104, 120, 123, 124, 126, 133
15	<i>Hysterothylacium adunacum</i>	<i>Neogobius fluviatilis pallasi</i> . <i>N. kessleri gorlap</i> . <i>N. melanostomus</i>	Intestine	Gorgan	C.S.	104
16	<i>Philometra karunensis</i>	<i>Barbus grypus</i> . <i>B. sharpeyi</i>	Swimbla	Khouzestan	M.	92, 100, 128

			dder			
17	<i>Philometra ovata</i>	<i>Barbus sharpeyi</i>	A.C.	Khuzestan	M.	74
18	<i>Philometra rishta</i>	<i>Blicca bjoerkna</i>	A.C. Gill	Guilan	C.S.	134
19	<i>Pseudocapillaria tomentosa</i>	<i>Barbus grypus. B. lacerta. B. capito. B. mursa. Capoeta capoeta. Cyprinus carpio</i>	Intestine. Digestive tract	Chaharmahal-Bakhtirari, Khuzestan, Mazandaran, West Azarbaijan.	C.S. M	20, 49, 74, 92, 97, 105
20	<i>Pseudopentagramma symmetrica</i>	<i>Chalcalburnus tarishi. Clupeonella cultriventris. Cl. engrauliformis. Cl. grimmi</i>	Digestive tract	Guilan, Mazandaran	C.S.	32, 133
21	<i>Raphidascaris acus</i>	<i>Abramis brama. C. carassius. Carassius auratus. Esox lucius. N. fluviatilis pallasii. N. kessleri gorlap. N. melanostomus. Neogobius bathybius. Perca fluviatilis. Rutilus frisii kutum. Scardinius erythrophthalmus. Tinca tinca</i>	Digestive tract. Intestine	Gorgan, Guilan, Mazandaran	C.S.	24, 53, 55, 72, 97, 104, 120, 122, 127
22	<i>Rhabdochona acuminata</i>	<i>Capoeta capoeta C. c. gracilis. Barbus brachycephalus</i>	Digestive tract	Guilan	C.S.	78
23	<i>Rhabdochona fortunatowi</i>	<i>Alburnus filippi. Barbus grypus. B. luteus. B. lacerta B. capito. B. pectoralis. Capoeta capoeta Carassius auratus. Cyprinus macrostomum. Nemacheilus bergianus. Neogobius fluviatilis. Silurus triostegus.</i>	Intestine	West Azarbaijan, Mazandaran, Khuzestan	C.S. M.	87, 101, 128
24	<i>Rhabdochona denudata</i>	<i>Barbus grypus. B. luteus. B. sharpeyi. B. pectoralis. Cyprinus macrostomum. Cyprinus carpio. Silurus triostegus.</i>	Intestine	Khuzestan	M.	128
25	<i>Rhabdochona hellichi</i>	<i>Barbus capito B. lacerta B. mursa. Capoeta capoeta Chalcalburnus chalcoides. Esox lucius</i>	Intestine	Mazandaran, West Azarbaijan, Guilan	C.S.	1, 97, 98, 101, 102
26	<i>Rhabdocuna filamentosa</i>	<i>Barbus brachycephalus. Varicorhinus capoeta gracilis</i>	Digestive tract	Guilan	C.S.	78
<b>Acanthocephala</b>						
1	<i>Acanthocephalorhynchoides cholodkowskyi</i>	<i>Aphanius vladkovi. Capoeta buhsei. C. c. gracilis. C. damascina. Cyprinus carpio. Rutilus rutilus caspicus.</i>	Intestine	Esfahan, West Azarbaijan, Chaharmahal-Bakhtiari	C.S.	29, 50, 112, 137
2	<i>Corynosoma caspicum</i>	<i>Acipenser guldenstadti. A. stellatus. A. stellatus. Huso huso</i>	Intestine	Guilan, Mazandaran	C.S.	8, 35, 123
3	<i>Corynosoma strumosum</i>	<i>Acipenser guldenstadti. A. stellatus. Huso huso. Clupeonella engrauliformis. C. cultriventris. C. grimmi Neogobius bathybius. N. fluviatilis pallasii. N. kessleri gorlap</i>	Intestine. Abdominal cavity	Guilan, Mazandaran, Gorgan	C.S.	32, 123, 104, 133
4	<i>Eubothrium acipenserinum</i>	<i>Huso huso</i>		Guilan		123
5	<i>Leptorhynchoides plagiccephalus</i>	<i>Acipenser persicus. A. guldenstadti. A. nudiventris. A. stellatus</i>	Intestine	Guilan, Mazandaran,	C.S.	28, 32, 98, 120, 123
6	<i>Neoechinorhynchus rutili</i>	<i>Barbus capito. Capoeta capoeta gracilis</i>	Intestine. A.C	Mazandaran, West Azarbaijan	C.S.	1, 73, 97, 102
7	<i>Neoechinorhynchus tylosuri</i>	<i>Aspinus vorax. Liza abu</i>	Intestine	Khuzestan		136
8	<i>Pomphorhynchus perforator</i>	<i>Barbus capito. B. lacerta. Capoeta capoeta gracilis</i>	Intestine	West Azarbaijan		101
9	<i>Pomphorhynchus leavis</i>	<i>Acipenser stellatus. Barbus capito. B. lacerta. B. mursa</i>	Intestine	Guilan, West Azarbaijan	C.S.	82, 98, 101
10	<i>Pseudocapillariatomentosa</i>	<i>Barbus grypus</i>	Intestine	Khuzestan	M.	128
<b>Crustacea</b>						
1	<i>Argulus foliaceus</i>	<i>Abramis brama. Aspius aspius. Alburnoides bipunctatus. Capoeta capoeta gracilis. Carassius auratus gibelio. Chalcalburnus chalcoides. Cyprinus carpio. Esox lucius. Hypophthalmichthys molitrix. Luciopeca luciopeca. Perca fluviatilis</i>	Body surface. Fins	Guilan, West Azarbaijan. Chaharmahal-Bakhtiari. Mazandaran	C.S.	72, 73, 87, 111, 102
2	<i>Ergasilus peregrinus</i>	<i>Acanthalburnus urmianus. Capoeta capoeta gracilis. Ctenopharyngodon idella. Cyprinus carpio. Leuciscus cephalus</i>	Gills. fins	West Azarbaijan, Zanjan	C.S.	40, 99, 73, 87
3	<i>Lamproglena chinensis</i>	<i>Capoeta damascina.</i>	Gills	Chaharmahal-Bakhtirari	C.S.	110
4	<i>Lamproglena compacta</i>	<i>Capoeta capoeta gracilis. Leuciscus cephalus</i>	Gills	Mazandaran, Zanjan, W. Azarbaijan	C.S.	40, 102
5	<i>Lernaea cyprinacea</i>	<i>Alburnus alburnus. Barbus lacerta. Capoeta aculeate. C. c. gracilis. C. damascina. Carassius carassius. Chalcalburnus chalcoides. C. mossulensis. Chondrostoma orientalis. Ctenopharyngodon idella. Cyprinus carpio. Hypophthalmichthys molitrix. Leuciscus cephalus. Mastacembelus mastacembelus. Pseudorasbora parva</i>	Fins. Operculum. Gills	Chaharmahal-Bakhtiari. Fars, Mazandaran, West Azarbaijan	C.S. M.	10, 49, 73, 111, 113, 114
6	<i>Lernaea elegans</i>	<i>Ctenopharyngodon idella. Cyprinus carpio</i>	Body surface	Mazandaran, Khuzestan, Esfahan	C.S. M.	31
7	<i>Lernaea ctenopharyngodoni</i>	<i>Acanthalburnus urmianus</i>	Fins	West Azarbaijan	C.S.	73
8	<i>Pseudotracheliastes stellatus</i>	<i>Acipenser guldenstadti. A. nudiventris. A. stellatus. A. persicus. Huso huso</i>	Fins.	Mazandaran	C.S.	38, 98, 107

			skin			
9	<i>Tracheliastes longicollis</i>	<i>Capoeta capoeta gracilis</i>	Fins	Zanjan, West, East Azarbaijan.	C.S.	40, 73, 139
10	<i>Tracheliastes polycolpus</i>	<i>Capoeta capoeta gracilis</i>	Fins	West Azarbaijan.	C.S.	73
	<b>Aspidogasterea</b>					
1	<i>Aspidogaster limacoides</i>	<i>Barbus brachycephalus. Rutilus frisii kutum. R. rutilus</i>	Digestive tract	Guilan. Mazandaran	C.S.	55, 66, 77
	<b>Amphilina</b>					
1	<i>Amphilina foliacea</i>	<i>Acipenser guldenstadti. A. persicus. A. stellatus</i>	Sexual glands	Guilan. Mazandaran	C.S.	69, 77, 82, 98, 120
	<b>Annelida</b>					
1	<i>Piscicola geometra</i>	<i>Tinca tinca</i>	skin	Guilan	C.S.	18

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