

# Parasitofauna of Certain Species of Fish Lowves Rivers Amudarya

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**Abstract:** *The article discusses the changes in the parasitofauna of some species of fish in the lower reaches of the river. Amu Darya. The latest data on the parasitic fauna of 4 species of indigenous commercial fish lower reaches of the Amu Darya river in a degraded environment (2014-2019). The depletion of the fauna of ichthyoparasites under the influence of the ongoing anthropogenic press and its causes is shown. Species of parasites with constant high infection and pathogenic forms that are potential pathogens of fish diseases and extreme environmental conditions of the region are indicated.*

**Keywords:** parasitofauna, commercial fish, anthropogenic press, Amu Darya delta

## 1. Introduction

The Amu Darya River, after the Volga River, ranked second in terms of size, productivity and biodiversity. Consistent management of the goods in the territory of the United States of America and the United States of America.

For the purposes of this Regulation, the following months shall be taken into account in the case of the said Member State:

In the lower reaches of the river. Many freshwater lakes dried up in the Amu Darya and new reservoirs were formed due to waste collector-drainage waters, highly mineralized (1.5-5 mg / l), contaminated with residues of mineral fertilizers, herbicides and pesticides. In the case of non-volatile non-ecologically advanced plants.

As a result, in the lower reaches of the river. From year to year, the Amu Darya decreased the number of aquatic organisms, mainly fish and forage aquatic invertebrates, which played the role of intermediate hosts of many helminths. For the purposes of this Regulation, the following measures shall be taken, in particular

Currently, in the Republic of Karakalpakstan, measures are being taken to restore and increase fish stocks of inland water bodies through the creation of lake-commercial farms. A set of measures is being carried out, including the fight against dangerous parasites and fish diseases, which determines the need to study the ichthyoparasitological situation in the lower reaches of the river. Ammunition in ecological schools.

## 2. Materials and Methods

For the purposes of this Regulation, the Council of the European Communities shall: Ammaryrias, in the center of the Aral Sea ecological crisis region. Parasitological materials in 2014-2019. in the Muynak and Sarybass bays of the sea, as well as in lakes Shegekul and Makpalkul.

Four fish species were studied by the method of complete parasitological dissection (Догель, 1993, Быковская-

Павловская, 1985). Their species composition and number are given in the relevant sections.

### Resolutions of action

In the course of the study, in the lower reaches of the Amu Darya River in 4 fish species, 54 species of parasites belonging to the following groups were found: sporozoa (1 species), mixosporids (4), ciliated (2), monogeneans (16), cestodes (5), trematodes (13), nematodes (7), leeches (1) and crustaceans (5). We are aware of the differences between the para-physiological and the new ecological regions of the Republic of Greece.

Krasnoperkka-*Scardinius erythrophthalmus* (Linne). Surveyed in lakes in the amount of 31 specimens. The total yield was 93.5%. In these fishes, 8 parasite species were found, belonging to myxosporidia (1 species) mako (2) The total investment was 93.5%. Highly extensive infection with the sapespecific monogenea *Dactylogyrus difformis* (75-80%) and metacercaria *Diplostomum spathace* was noted. Other types of goods are used and are not available. Comparative measures on the basis of the requirements of the law of the Republic of Latvia. (The parasites registered in the rudd have

For the twentieth day of the year, the total cost of the second year shall not exceed 11 months. In new conditions, the species composition of the rudd parasites decreased by 4.5 times.

Bream-Abramis brama orientalis Berg. 49 specimens were recovered: in Sarybassky Bay-15, lakes Shegekul 16 and Makpalkul-18. The total yield was 88.0%. The examined individuals were invaded by 14 parasite species related to myxosporidia (1 species), monogenes (4), cestodes (1), trematodes (5), nematodes (2), and crustaceans (1). Among them, 8 species (57.1%) develop with the participation of intermediate hosts. Specific species include monogeneans parasitizing on the gills of the bream - *Dactylogyrus wunderi* (86.6-90%), d zandti (45.5-56.2%) and *Diplozoon paradoxum* (27.2-33.3%). In the parasite fauna of bream, a large place is occupied by species that are widespread in other cyprinids. Among them, at low intensity,

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metacercariae-*D. spathaceum* (20-83.3%, eyes) and the nematode *Contracaecum microcephalum* (55.5-66.6%, intestines) were more common. Under extreme conditions of the lower reaches of the Amu Darya River, the species composition of bream parasites decreased by 17 species (54.8%), i.e. 2.2 times.

Crucian carp-*Carassius auratus gibelio* (Bloch). 44 specimens were recovered: in lakes Shegekul 16 and Makpalkul 28. The total infection rate was 95.4%. In crucian carp, 13 species of parasites were recorded, including monogeneans (7 species), cestodes (1), trematodes (3), nematodes (1), and crustaceans (1), which have a wide range of hosts. More than half (53.8%) of the crucian carp parasites are monogeneans, which are not specific to this host. The number of parasites with a complex development cycle is slightly more than a third (38.4%). The parasite fauna of the crucian carp has changed relatively little. Crucian carp lost 2 species of cestodes, 1 species of trematodes and crustaceans each, and acquired 5 species of dactylogiruses (*D. formosus*, *D. baueri*, *D. inexpectatus*, *D. dogieli*, *D. arcuatus*).

Carp-*Cyprinus carpio* Linne. Explored in all bays and lakes; 71 specimens were exposed. The overall infection rate is high (91.5%). The parasitic fauna of the common carp in comparison with other fish species is quite numerous - 18 species: coccidia (1 species), mixospores and ciliates (2 each), monogeneans (4), cestodes and trematodes (3 each), nematodes (2), leeches and crustaceans (by 1). Specific species of coccidia - *Eimeria carpelli* (46.6-77.7%), monogenea *Dactylogyrus extensus* (86.6-100%), *D. anchoratus* (40.0-72.2%) and widespread metacercariae *D. spathaceum* (53.5-80.0%) from trematodes. The monogenean *Cyrodactylus medius*, characteristic of this host, was also found in small quantities. The intestinal nematode *C. microcephalum* is common (33.3-55.5%), which is also recorded in other fish. Other types of carp parasites have a wide range of hosts and are found in small numbers. Among carp parasites, 57.9% of species have direct development, 42.1% have a complex development cycle. Previously, among the indigenous fish of the region, the carp had the richest parasite fauna (49 species), consisting of 12 groups: flagellates, coccidia, microsporidia (1 species each), myxosporidia (6), leeches (2), molluscs (1) and crustaceans (5) ... Now only 4 species of monogeneans have been found out of 10 previously noted species. In recent studies, 4 types of myxosporidia, nematodes, crustaceans, 3 types of ciliary and trematodes, 2 types of cestodes were also not found. Flagellates, microsporidia and molluscs have generally dropped out of the carp parasite fauna. The carp lost about 2/3 (61.3%) of the parasite species, mainly due to those developing with the participation of intermediate hosts.

### 3. Conclusion

Based on the results of these studies (2014-2019). in the lower reaches of the river. In the Amu Darya, 55 species of parasites were registered in 4 fish species. In general, the parasite fauna of the studied fish became 4.7 times poorer.

The qualitative and quantitative composition of the parasite fauna largely depends on the frequency of occurrence of the

host itself. The high number of the host provides the possibility of contact even with rare species of parasites (Dogel, 1962). In the studied region, as a result of anthropogenic pressure, the number of fish decreases from year to year. Apparently, this is the main reason for the weak infection of fish with many types of parasites.

According to our data, the carp (18 species) and crucian carp (16 species) have a relatively rich fauna of parasites. This indicates that the number of these fish in the water bodies of the region remains more or less stable.

The fish studied by us did not have ectoparasites - parasitic protozoa, leeches, larvae of mollusks and parasitic crustaceans, or there was a low invasion of these parasites, which is associated with a change in the hydrochemical regime, primarily increased mineralization. The chemical composition of water also regulates the composition and number of forage invertebrates, in which the larval stages of many fish helminths parasitize.

**Table 1:** Data on the parasite fauna of fish in the lower reaches of the Amu Darya (2014-2019)

A group of parasites	<i>Scardinius erythrophthalmus</i>	<i>Abramis brama</i>	<i>Carassius</i>	<i>Cyprinus carpio</i>
Flagellates	-	-	-	-
Sporozoans	-	-	-	1
Myxosporidia	1	1	-	2
Microsporidia	-	-	-	-
Ciliary	-	-	-	2
Monogeneans	1	4	7	4
Cestodes	-	1	1	3
Trematodes	2	5	3	3
Nematodes	2	2	1	2
Leeches	-	-	-	1
Shellfish	-	-	-	-
Crustaceans	2	1	1	1
Total	8	14	13	19

In the extreme conditions of the region, the number and species composition of planktonic and benthic organisms consumed by fish decreased.

It is especially important to note that under extreme environmental conditions, the studied fish retained a consistently high infection by certain species, in particular, those parasitizing on the gills and metacercariae (*D. spathaceum*, *T. clavata*).

Flagellates (5 species), microsporidia (1 species), leeches (2 species), and mollusk larvae (1) have disappeared from the parasite fauna of the fish studied.

Among the registered kinds of fish parasites are pathogenic parasitic protozoa *Eimeria carpelli*, *Myxobolus pseudodispar*, *Ichthyophthirius multifiliis*, *Trichodinella epizootica*, monogeneans *Dactylogyrus extensus*, cestodes *Caryophyllaeus fimbriceps*, *Bothriocephalus opsarichthydis*, *Gryporhynchus pusillum*, trematodes *D. spathaceum*, *Posthodiplostomum cuticola*, nematodes *Raphidascaris acus*, *Contracaecum microcephalum*, leeches *Piscicola geometra*, crustaceans *Ergasilus sieboldi*. These types of parasites can be considered as potential pathogens of fish diseases in our region. If favorable conditions arise

for their development in a short time, they can cause an outbreak of diseases in fish. Particularly dangerous are representatives of specific types of dactylogiruses and widespread diplostomatids, for which a high extent of infection is constantly recorded.

Thus, in order to develop measures to combat fish parasites, it is necessary to have factual data on their bioecological characteristics at the population level, since this is an urgent issue for parasitological research in the region.

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