

Monogenean Parasites of Caspian frisian Roach (*Rutilus frisii Kutum*) in Sefid-Rood River and Caspian Sea

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Abstract: The Caspian frisian roach (*Rutilus frisii kutum*), economically a very important fish species in Iran, is propagated in fishponds, reared into the rivers in fingerling size and then harvested from the Caspian Sea in adult stage. We found six monogenean parasites on the Caspian frisian roach including five *Dactylogyrus spp.* on fingerlings cultured in fishponds and rivers and two *Dactylogyrus spp.* on wild adult specimens living in Caspian Sea. With the exception of *D. frisii* that proved to be the most common monogenean and found a good milieu for its development both in flowing rivers and in Caspian Sea, the other parasites occurred either in Caspian Sea (*D. nybelini*) or in freshwater (*D. haplogonus*, *D. rarissimus*, *D. suecicus*, *D. turaliensis*). The objectives of present research work are to clear the sources of infection of Caspian frisian roach fingerlings to monogenean parasites and to recommend approaches for the improvement of pond technology in order to diminish the intensity of parasites without having to use high amounts of organophosphate insecticide in ponds.

KEY WORD: *Dactylogyrus*, Caspian frisian roach, Iran

Introduction

Caspian frisian roach (*Rutilus frisii kutum*) is highly appreciated by Iranian consumers and is artificially propagated in huge numbers in Iran. While examining *Dactylogyrus* infection of this species a mild difference should be taken between the propagating period and the rest of the year. The brood stocks of fish migrate to the rivers during spring and then leave rivers after spawning. The produced larvae remain in rivers up to fingerling size (3-4 months) before migrating to sea. However, the presence of both breeders and fingerlings in rivers are somehow overlapped.

The main emerged question is whether fishes in the freshwater and brackish-water had the same monogenean or not. If such a case is possible, then how freshwater parasites can survive in brackish water environment.

Material and Methods

We have collected fish (Caspian frisian roach) from ponds allocated for production of the fingerlings in Sangar and Semeskandeh Fish Culture Centers irrigated from Sefid-rood and Tajan rivers respectively. Fries originated from natural breeding migrated to Sefid-rood River for spawning purpose in Caspian region of Iran during 1990-1998. Totally, 150 fingerlings and 25 adults were examined. To examine gill parasites, Caspian frisian roach breeders were collected either from catching point in Caspian Sea or migrant specimens in rivers flowing into Caspian Sea. These fish were carried alive to the laboratory and were killed by decapitation. Monogeneans were collected from the gills of fish under a stereomicroscope at 10-40 fold magnification, vigorously separated from the gills with a pipette and fixed under a cover slip in ammonium picrate and glycerin-gelatin according to Fernando *et al.* (1972) and Gussev (1983), respectively. A calibrated microscope micrometer was used for measurements, and a microscope with drawing attachment did drawings. Parasites were identified according to Gussev (1985).

Results

Our examination showed that Caspian frisian roach was infected by six species of the genus *Dactylogyrus* (Table 1). Fingerlings cultured in fish pond were infected by five *Dactylogyrus* species consisting of *D. frisii*, *D. haplogonus*, *D. rarissimus*, *D. suecicus* and *D. turaliensis*, whereas adult fish obtained from Caspian Sea was found to be infected only by *D. frisii* and *D. nybelini*. Except *D. frisii* which proved to be the most common and found a good milieu for its development both in flowing rivers and in Caspian Sea, others were specific either to Caspian Sea (*D. nybelini*) or freshwater (*D. haplogonus*, *D. rarissimus*, *D. suecicus* and *D. turaliensis*).

Table 1: Comparison of monogenean parasites isolated from *Rutilus frisii kutum* in freshwaters and Caspian Sea

Dactylogyrus spp.	Sefid-rood River	Caspian Sea
<i>D. frisii</i> (Bychowsky 1933)	+	+
<i>D. haplogonus</i> (Bychowsky 1933)	+	-
<i>D. nybelini</i> (Markewitch 1933)	-	+
<i>D. rarissimus</i> (Gussev 1966)	+	-
<i>D. suecicus</i> (Nybelini 1937)	+	-
<i>D. turaliensis</i> (Aligadzhiev, Gussev, Kazieva 1984)	+	-

- Indicated that no parasites species were found

Discussion

Susceptibility of *Dactylogyrus spp.* to salt concentration is well known (Schaeperclaus, 1992; Bauer *et al.* 1981; Molnar & Szakolczai, 1980). Nevertheless, at least *D. frisii* seems to survive in the salinity of Caspian Sea.

Special attention should be paid to the source of infection because if migrating spawners are infected only by two *Dactylogyrus spp.* so how the fingerlings receive infection from four freshwater-specific parasites. Examining other fish species, it turned out that *D. haplogonus* also occurred on the gills of *Vimba vimba*, and *D. turaliensis* also infected *Rutilus rutilus caspicus* (Jalali & Molnar, 1990a ; Gussev, 1985). The other two parasites, i.e. *D. rarissimus* and *D. suecicus*, are commonly found in different races of *Rutilus rutilus* (Gussev, 1985), the fish species that is the most abundant population in main rivers flowing into the Caspian Sea. Therefore, this species can be one of the infection sources of Caspian Frisian roach fingerlings.

In case of *D. vastator*, it is well known (Layman, 1948 ; Bauer *et al.*, 1981) that over wintering eggs may produce the infection of the fingerlings in next spring. Similarly, it is suggested that over wintering eggs of a part of the foregoing parasites on either above-said sensitive host or Caspian frisian roach fingerlings themselves in pond might be the other source of infection.

According to Gussev (1985), *D. frisii* infects only *Rutilus frisii kutum*. Our findings showed that both breeders and fingerlings of Caspian frisian roach in two ecologically different habitats are also infected by *D. frisii* (Table 1). It should be pointed out that besides a minor chronological overlapping of presence of breeders (migrated to rivers) and fingerlings (already produced in freshwater) can be the most practicable way of *D. frisii* transmission to the fingerling from breeders.

There are special and small population of Caspian frisian roach adult so-called "Autumnal migrant" groups which enter rivers at late autumn every year. A part of them remains until late winter for propagation purpose. From the pervious studies, it could be assumed that possible source of *D. frisii* infection of Caspian frisian roach fingerlings may be either directly by the older specimens of the same fish species or probably by over wintering eggs of *D. frisii* through infected autumnal migrants of adult Caspian frisian roach. Regarding Caspian frisian roach fingerlings as a new host for some of the monogenean parasites, the following speculation can be made: *D. rarissimus*, *D. suecicus* and *D. turaliensis* are generally specified to the gills of *Rutilus rutilus*. In our studies, however, *Rutilus*

frisii kutum fingerlings found to be infected by the foregoing parasites as a new host. This situation may be interpreted by the fact that related species of the genus *Rutilus* are often infected by the common monogenean parasites especially in the early stages of their life spawn, which depends on similar ecological conditions prevailing in their habitat.

Our studies conducted in fish farms on fingerlings of the Caspian Frisian roach shows that young fish can sometimes be infected heavily by *Dactylogyrus spp.* and they cause even mortalities in these stocks. To prevent the infection, improvement of pond technology, i.e. smaller fish density, appropriate depth of water, and optimum water discharge, which strongly diminish the intensity of parasites, is recommended.

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