



Gill Ectoparasites of Goldfish (*Carassius auratus*) Imported from Syria

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Keywords

Gill ectoparasites
Carassius auratus,
Parasitologic index

ABSTRACT

This study was carried out to determine species of ectoparasites from goldfish (*Carassius auratus*) imported from Syria. One hundred of live imported goldfish from Syria, May and June between month in 2019, were examined in the laboratory of Aquaculture Faculty, Mersin University. Of the seven species of ectoparasites isolated in this study, four were monogeneans (*Dactylogyrus* sp. *Dactylogyrus vastator*, *Gyrodactylus* sp. and *Gyrodactylus chinensis*) and two were protistan (*Trichodina* sp., *Ichthyophthirius multifiliis*) and one were crustacean (*Argulus japonicus*). The fish examined were imported from Syria. Although goldfishes were carried by trucks many of which came from the single exporting region of Syrian Arab Republic, the all trucks examined were found to have high prevalence and intensity of parasites. It is suggested that proper quarantine procedure was not performed before retail selling of these imported fish. According to consequences of this study, It is recommended that before transporting internationally, fish should be examined for parasitic risk and other pathogens to prevent the spread of parasitic diseases.

1. INTRODUCTION

The ornamental fish industry in Turkey has grown in recent years (Hekimoğlu, 2006. 237-241). Gold fish (*Carassius auratus*) is considered among the most important ornamental fish in Turkey. Most of these fish are imported from Asian countries. Lately, these fish are the largest of all aquarium fish imported from Syria into Turkey.

In many countries, the tropical ornamental fish trade operates without appropriate quarantine practices. These fish may cause problems in the importing country, since they can die of infections soon after their arrival, or during transportation, resulting in economic losses. Recently, mortalities have occurred in Gold fish (*Carassius auratus*) imported from Syria into Turkey and a number of parasites have been observed in these fishes.

The presence of parasites on ornamental fishes and their transport to other countries has been reported worldwide; in China (Kuo, vd.1994. 227-238), Germany (Moravec, vd.1999: 296-310), Australia (Dove & Ernst, 1998 : 1755-1764, Evans & Lester, 2001: 51-55), South Africa (Mouton, vd., 2001: 327-333), France (Michell, vd., 2002:253-263), Korea (Kim, vd.2002: 231-

235), Norway (Levsen, vd. 2003:639-649) and Sri Lanka (Thilakarathne vd.2003; 154-162). The most important ectoparasites of freshwater ornamental fishes are ciliate protozoans such as; *Ichthyophthirius multifiliis*, *Trichodinids*, *Chilodonella*. Monogeneans are typically parasites of the gills and skin of the fishes and are generally host specific *Gyrodactylids* are skin and fins while *Dactylogyrids* live on gill. *Argulus foliaceus* and *Lernaea cyprinacea* has been reported parasitizing several freshwater fishes (Woo ,1995).

In this study, we aimed to diagnose the parasites in freshwater Gold fish (*Carassius auratus*) and determine the prevalence of some of these parasites imported into Turkey from Syria.

2. METHOD

One hundred live imported goldfish from Syria, May and June between month in 2012, were collected from a quarantine facility (with their original water) and transferred by trucks into Syria to examine in the laboratory of diagnosis of Department of Aquaculture, Faculty of Fisheries Mersin University. Fish samples were weighed and measured. Routine laboratory examinations, like examination of wet mount of skin and

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Cite this article;

Koyuncu C E (2021). Gill Ectoparasites of Goldfish (*Carassius auratus*) Imported from Syria. *Advanced Underwater Sciences*, 1(1), 08-10

direct of gills examination were performed. Wet mounts from both left and right gill arches were examined from each fish. Then for more precise observation, stereo and light microscopies were used in examination of gill arches. Photo of any infected fish was taken with the aid of phase contrast microscopy (Nikon). Monogenean parasites were fixed in 70 % ethanol, and preserved on slides using Malmberg's method (ammonium picrate glycerine) and protozoans were airdried onto slides and stained with Giemsa solution. Identification of monogenean species was made by using morphological (hook, marginal hook, their bars and shape/number of copulatory organs) and morphometric(hook, marginal hook and bars parameters) characteristics. The parasitic arthropod were fixed in 70% ethanol and identified using by gross morphology (size, appendage morphology, urosome, and respiratory areas) (Rushton-Mellor, 1994: 51-63; Lom .& Dykova 1992:253).

3. RESULTS

The parasites identified from gill of one hundred samples were found comprising: four species belonging to two genera of, monogeneans trematodes, *Dactylogyrus* sp, *Dactylogyrus vastator*, *Gyrodactylus* sp., and *Gyrodactylus chinensis*, two protistan species *Trichodina* sp., *Ichthyophthirius multifiliis*, and one arthropoda species *Argulus japonicus*. *D. vastator* was the parasite showing the highest prevalence rate in one parasitized with almost 50% followed by *Gyrodactylus* sp. with 16% indicating high and low prevalences among monogeneans. *Trichodina* sp. and *Ichthyophthirius multifiliis* show prevalences of 31 and 25% among the protozoan respectively. *Argulus japonicus* show 80% prevalence among the arthropod.

Table 1. Prevalence of parasites isolated from goldfish (*C. auratus*).

Parasite	Prevalence (%)	Parasite taxonomy
Metazoans		
<i>Dactylogyrus</i> sp.	28	Monogenea
<i>Dactylogyrus vastator</i>	50	Monogenea
<i>Gyrodactylus</i> sp.	16	Monogenea
<i>Gyrodactylus chinensis</i>	29	Monogenea
Protozoans		
<i>Trichodina</i> sp	31	Ciliata
<i>Ichthyophthirius multifiliis</i>	25	Ciliata
Arthropoda		
<i>Argulus japonicus</i>	80	Branchiura

4. DISCUSSION

This study is the first report of Gold fish imported from Syria into Turkey . We found a total of seven species of parasites among Gold fish in this study (Table1).

Ichthyophthirius multifiliis is a widely distributed ectoparasite, and probably occurs worldwide (Koyuncu, 2009: 25-27). In this study all trucks originating from the same region were found to have *I. multifiliis* and *Trichodina* sp.intensity of ectoparasites.

It was difficult to determine the cause of death in this case, however, because we also found *Trichodina* sp. in the same stock. *Trichodinids* are essentially commensals and never occur in large numbers on healthy fish. However, in stressed conditions caused by some other factors such as poor water quality, overcrowding, they can proliferate massively and behave like serious ectoparasite (Koyuncu, 2009: 25-27). We suspect that both poor conditions and *I. multifiliis* infection facilitated the proliferation of *Trichodina* sp. and caused the death of the host in this outbreak.

The monogeneans *Dactylogyrus* sp. and *D. vastator* were described from Gold fish (*Carassius auratus*). Another monogenean, *G. chinensis*, was first reported as Gold fish (*Carassius auratus*) in Turkey. This monogeneans are likely to have harmful effects not only on Gold fish (*Carassius auratus*), but also on other Gold fish, because it can lead to other hosts in confined environments or in stressful conditions.

The copepod *A. japonicus* has a broad host range including Gold fish (*Carassius auratus*), and can cause serious damage (Rushton-Mellor, 1994: 51-63). This copepod has a worldwide distribution, partly because of the international trade of tropical fishes (Rushton-Mellor,1994: 51-63; Lom .& Dykova 1992: 253). Its pathogenicity is well-known because it can cause serious mortality due to hemorrhages and secondary bacterial infections, especially in cases of heavy infestations (Şahin , 2004). In this study all trucks originating from the same region were found to have intensity of these ectoparasites.

The Gold fish trade constitutes a significant portion of worldwide trade in aquatic animals and a large number of imported Gold fish originate from Southeast Asian countries. (Evans & Lester , 2001: 51-55). Turkey also imports various kinds of Gold fishes from Syria; the scale and number of imported Gold fish are increasing. However, most fishes are imported without proper quarantine measures, and consequently, the fishes infected with undetected pathogens can be distributed to retailers and sold to consumers. Thus, many undescribed parasites could be entering importing countries with imported fish.

Mousavi studied parasites of ornamental fish imported in Iran and reported ten parasite species (Mousavi vd.2009:175-180). Other investigator and authors have described many of isolated parasites in this study, which can infect ornamental fish of many species (Evans & Lester , 2001: 51-55; Thilakaratne vd.2003:

154-162; Şahin, 2004: 63: 17; Mousavi vd.2003: 297-300; Mousavi vd.2009: 175-180.).

In the present study, it has been confirmed that parasites are prevalent in Gold fish (*Carassius auratus*), imported into Turkey from Syria.

Author contributions

All contributions belong to the author in this paper.

Conflicts of interest

The author declares no conflicts of interest.

Statement of Research and Publication Ethics

The author declare that this study complies with Research and Publication Ethics

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