EFFECT ON MARKETABILITY OF ORNAMENTAL FISHES DUE TO PARASITIC INFECTION

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ABSTRACT

Present study was carried out to reveal the prevalent and unforeseen parasitic infection in commercially available ornamental fishes which may credit to their marketable value. Seven different species of ornamental fishes namely Carassius auratus (Gold Fish and Black Moor Gold), Cyprinus carpio (Koi Carp), Poecilia reticulate (Guppy), Rasbora daniconius (Slender Rasbora), Puntius conchonicus (Rosy Barbs), Trichogaster lasius (Brass gold) were screened for the occurrence of infection. Cyprinus carpio showed maximum infection caused by Argulus (Crustacea: Branchiuran) intensity=8-12 per fish. Argulus was observed as a primary infection which was followed by bacterial infection (dropsy) as secondary infection. While minimum infection was caused by Lernaea in Carassius auratus (intensity=1 per fish).

Keywords – Argulus, ornamental fishes, parasitic, Lernaea

INTRODUCTION

Ornamental fish culture has rapidly developed in different countries. Parasitic infestation is the most important disease affecting ornamental fish and it causes economical losses for this growing industry in intensive culture systems. Fish may be infected by the parasites as final or intermediate hosts in a parasitic life cycle (Hoffman 1999; Smith and Roberts 2010). Fish parasites and their effects have become increasingly visible during the latest decades in connection with the development of freshwater ornamental Fish industries throughout the world. Diseases caused by parasites are widespread and cause loses of fish in intensively stocked pond and aquarium. Ectoparasites of freshwater ornamental fish come in all sizes and shapes and include single-celled protozoan, and multicellular trematodes (flatworms), crustaceans and arthropods (Roberts 2010).

The genus Argulus (Crustacea: Branchiura), or fish louse, are common parasites of freshwater fish (Bauer, 1991, Yildiz and Kumantas, 2002). According to Eissa (2002) and Eissa and Mohamed (2004) Argulus contributes most common disease Argulosis (a crustacean diseases) affecting ornamental fishes which is specifically common in goldfish and koi (Noga, 2010). Thus, present study was conducted to investigate the prevalence of parasitic infection or diseases among ornamental fishes, which may credit to their marketable value.

MATERIAL AND METHODS

Collection of Sample:
Fish samples were collected from different aquarium shops of Bhopal Region. The fishes were examined in live condition and the diseased fishes were sorted out and brought to the laboratory for further examinations.

**Laboratory Examination of infected fish samples:**
The fish which showed the symptoms of the parasites on the body surface, (when present) were taken out with the help of saline water (0.75%) and forceps kept in slide. Parasite was kept in 0.75% saline covered with cover slip and examined under microscope. Mucus was scraped from the skin and gills with a cover glass and fresh smears were prepared on slides in a drop of water under a cover slip and then examined for protozoan parasites. While macro-parasites were visible to naked eyes and were collected by using fine brush, washed for several times in normal saline solution. The collected crustaceans were counted, fixed in 70% alcohol, preserved in alcohol glycerol (4:1) for permanent mounts, cleaned and mounted. The parasites were identified microscopically using dissecting microscope as described by Woo (1995).

**RESULTS**
During the present study seven different variety of ornamental host fishes were collected *Carassius auratus* (Gold Fish), *Carassius*

**Table .1 Showing a List of Parasites collected from different ornamental species**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ornamental Fish Species</th>
<th>Parasites collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Carassius auratus</em> (Gold Fish) (N=6)</td>
<td>Lernaea and Protozoan infection</td>
</tr>
<tr>
<td>2</td>
<td><em>Carassius auratus</em> (Black Moor Gold) (N=5)</td>
<td>Fin and Gill rot and Protozoan infection</td>
</tr>
<tr>
<td>3</td>
<td><em>Cyprinus carpio</em> (Koi Carp) (N=5)</td>
<td>Argulus and Dropsy</td>
</tr>
<tr>
<td>4</td>
<td><em>Puntius concholicus</em> (Rosy Barbs) (N=5)</td>
<td>Skin and fin rot infection</td>
</tr>
<tr>
<td>5</td>
<td><em>Rasbora daniconius</em> (Slender Rasbora) (N=5)</td>
<td>Skin and fin rot infection</td>
</tr>
<tr>
<td>6</td>
<td><em>Poecilia reticulate</em> (Guppy) (N=5)</td>
<td>Skin and fin rot infection</td>
</tr>
<tr>
<td>7</td>
<td><em>Trichogaster lasius</em> (Brass gold) (N=5)</td>
<td>Skin and fin rot infection; Protozoan infection</td>
</tr>
</tbody>
</table>

**Fig. 1 Showing Prevalence of different parasite infestation**

![Graph showing the prevalence of different parasite infestations](image-url)
auratus (Black Moor Gold), Cyprinus carpio (Koi Carp), Poecilia reticulate (Guppy), Rasbora daniconius (Slender Rasbora), Puntius conchonicus (Rosy Barbs), Trichogaster lasius (Brass gold). Following symptoms were observed in infected fishes observed under present study - Scratching and scratching of objects, Excessive mucus secretion, discoloration and pale coloration of fins and scales, frayed fins, cloudy eyes, black and white spots on external skin of fish. List of Parasites collected from different ornamental species were represented in Table-1

Fig. 2 Showing Argulus specimen collected from Cyprinus carpio

Cyprinus carpio showed maximum Argulus infestation (P [%] = 70%; intensity=8-12 per fish). It was observed to have multiple infection primarily by Argulus and secondary infection by bacteria results in dropsy condition. While minimum infection (P [%] = 16.6%; intensity=1 per fish) by Lernaea in Carassius auratus (Fig.1).

Fig. 4 Photograph showing Lernaea

Fig 3 Photograph showing Lernaea (Arrow) attached to external surface of Carassius auratus

Fig. 5 Microphotograph showing enlarged anterior end of Lernaea

Fig. 6 Photograph showing the bacterial infection (Dropsy) in Cyprinus carpio

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Fig.7 Photograph showing the bacterial infection (Dropy) along with Argulus attached to external surface (Arrow) in Cyprinus carpio

DISCUSSION

During present investigation, one protozoan, two crustaceans and bacterial infections were commonly observed among seven ornamental fishes. Out of which Argulosis is the most dominating parasitic disease.

Protozoans are the most common ectoparasites encountered in ornamental fish. Although some authors viz. Krier and Baker (1987), Durborow et al. (1998), Scholz (1999), consider them harmless, many serious fish losses are caused by protozoan ectoparasites. Protozoans are microscopic and mainly infect the gills, fins, and skin of fish.

The occurrence of parasites in ornamental fishes has been documented by Koyuncu and Cengizler (2002), Koyuncu (2009), Kayis et al. (2009). These studies include many protozoan and metazoon parasites and also their host fish such as Ichthyobodo sp., Ichthyophthirius multifilis, Chilodonella sp., Trichodina spp., Dactylogyrus extensus, Gyrodactylus bullatarudis, Lernaea cyprinacea, Argulus foliaceus, Argulus japonicus and Capillaria sp. from gold fish, guppy and cichlids by Koyuncu (2009), Ambiphyra spp. from guppy by Kayis et al. (2009) and Oodinium pillularis from Poeciliidae by Koyuncu and Cengizler (2002).

Bacteria are one of an important causative agent of fish diseases in both wild and cultured fish and are responsible for serious economic losses. Many pathogenic species of bacteria can present on skin infections especially flexibacteria, aeromonads and vibrios. Fishes infection characterized by ulcer, hemorrhage, scale loss, tail and fin rot and dropsy includes several bacterial diseases (Chowdhury, 1997). Most reported dinoflagellate (Protozoan) parasites were from aquarium fish (Lom and Schubert, 1983). Many tropical fish species, such as cyprinids, are susceptible Oodinium pillularis from Cyprinus carpio and Poecilia spp. (Saglam, 1992; Koyuncu and Cengizler, 2002) have been reported in Turkey. While, during present study tail and fin rot and while spots were observed in Poecilia reticulate (Guppy), Rasbora daniconius (Slender Rasbora), Puntius conchonicus (Rosy Barbs).

Notash (2013) studied the prevalence of Argulus in Goldfishes (Carassius auratus) of east Azerbaijan province of Iran. Eissa and Mohamed (2004) and Mousavi et al. (2011) reported that the prevalence of infestation of argulos in C. auratus were 27.5%, 26.09% with intensity of 2-7 and 2, respectively. In contract during present study, Cyprinus carpio are more susceptible to the infestation with Argulus (70%) with intensity of intensity=8-12 per fish. Abd et al. (2013) also revealed the prevalence of Argulus in Carassius auratus and Cyprinus carpio were 31.33% and...
28% respectively, however, the intensity of infestation reached 2-8 and 1-5 in both species respectively.

Vimalraj et al. (2012) collected *Lernaea Cyprinacea* (Anchor Worm) Infestation in Gold Fishes. During present investigation *Lernaea* is collected from *Carassius auratus* (Gold Fish) and showed minimum infection (P = 16.6%; intensity=1 per fish).

**REFERENCES**

observed on *Capoeta trutta* caught in the polluted region of Keban Dam Lake (in Turkish). *E U J Fish Aquat Sci.* 8:143-154.


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