

CAPILLARIOSIS IN BREEDER DISCUS  
(*SYMPHYSODON AEQUIFASCIATUS*) IN IRAN

**Hooman Rahmati-holasoo<sup>1</sup>, HosseinAli Ebrahimzadeh Mousavi<sup>1\*</sup>,  
Mehdi Soltani<sup>1</sup>, SeyedHossein Hosseini<sup>2</sup>, Masoomeh Ghadam<sup>1</sup>  
and Reza Samani<sup>3</sup>**

<sup>1</sup>University of Tehran, Faculty of Veterinary Medicine, Department of Aquatic  
Animal Health, P.O. Box: 14155-6453, Tehran, Iran

<sup>2</sup>University of Tehran, Faculty of Veterinary Medicine, Department of  
Parasitology, P.O. Box: 14155-6453, Tehran, Iran

<sup>3</sup>University of Tehran, Faculty of Veterinary Medicine, Department of  
Pathobiology, P.O. Box: 14155-6453, Tehran, Iran

**Abstract:** The global ornamental fish trade is a rapidly growing industry. Cultivation and propagation of ornamental fishes have been increasing in the last 20 years in Iran. Discus (*Symphysodon aequifasciatus*) from *Cichlidae* is one of the most popular and expensive aquarium fish. In the past few years farming of this fish has been well developed in Iran. Two breeder discus fish (*Symphysodon aequifasciatus*) from two different propagation centres (with high mortality) with signs of anorexia, loss of balance, moribundity and darkness in skin colour were referred to Laboratory of Aquatic Diseases of Veterinary Faculty, University of Tehran. After the survey of ectoparasites, necropsy was performed under aseptic conditions; bacterial culture on standard media was done and the alimentary canal was extruded. In both fish no ectoparasite was detected and no bacteria from these cases grew on the standard media. In internal survey 5 and 25 nematodes were detected in each fish. A high number of free eggs were observed in intestine of fish. Regarding morphological characteristics of the nematodes and their eggs, they were identified as *Capillaria* sp. Treatment of other fish with levamisole was effective and the loss was terminated. Some helminthes like *Capillaria pterophylli* Heinze, 1933, can cause a high mortality in cichlid aquarium fishes. This study showed that infection with some species of *Capillaria* could cause a heavy loss in ornamental fish from *Cichlidae*. Diagnosis of parasites of these fishes can help us to prevent high mortalities.

**Key words:** discus, nematode, capillaria, levamisole, Iran.

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\*Corresponding author: e-mail: hmosavi@ut.ac.ir

## Introduction

The global ornamental fish trade is a rapidly growing industry. Aquarium fish constitute an extremely large segment of the pet animal industry (Winfree, 1989; Noga, 2010). Although this worldwide interest in ornamental fish has led to developments in their culture techniques (Wilson et al., 2001) there are still many difficult-to-culture species with high demand. Cultivation and propagation of ornamental fishes have been increasing in the last 20 years in Iran. More than 150 species of fresh water ornamental fishes are farmed in Iran. Discus (*Symphysodon aequifasciatus*) from *Cichlidae* is one of the most popular and expensive aquarium fish that lives in fresh water and discus is characterised by high price and demand all over the world (Lim and Wong, 1997; Chong et al., 2002). Origin of the fish is the Amazon River in South America. Discus is considered as a difficult-to-culture species due to its complex reproductive behaviour, involving parental care of eggs and newly hatched larvae (Chelappa et al., 2005) that suffer from mass mortalities and inadequate growth in captivity (Chong et al., 2005). In the past few years farming of this fish has been well developed in Iran. Some cases of its propagation have been reported in Iran, but most of them have been imported to the country. To the best knowledge of the authors there are few studies on diseases of discus and causes of fatality that were reported in Iran and very little research has been done on the helminth parasites of freshwater ornamental fish in Iran. The objective of this study was to survey the causes of loss of the fish in propagation centres in Tehran, Iran.

## Materials and Methods

Two breeder discus fish (*Symphysodon aequifasciatus*) from the two different propagation centres (with high mortality) with signs of anorexia, loss of balance, moribundity and darkness in skin colour were referred to Laboratory of Aquatic Diseases of Veterinary Faculty, University of Tehran in August and October 2009. In both cases, fish were first examined for ectoparasites using wet mount under a light microscope. To study bacterial infection and endo-parasitic infestation they were euthanised. Necropsy was performed under aseptic conditions; bacterial culture on standard media was done and the alimentary canal was extruded. Standard media were incubated in incubator for 72 hours. Then the alimentary ducts of those fish were observed under a light microscope and a stereo microscope. Parasites of alimentary tracts were counted and fixed in 70% ethanol, and for examination, they were cleared using glycerine. According to the suggestions of Bassler (2006), for treatment of other fish that were kept in 150 litres aquariums in propagation centre, levamisole (200 mg per 100 litres) was administered for 2 days. After 1 and 2 weeks, the treatment was repeated again.

## Results and Discussion

In both fish no ectoparasite was detected and no bacteria from these cases grew on the standard media. In internal survey 5 and 25 nematodes were detected in each fish. Some nematodes were observed under a light microscope. Both male and female nematodes were seen in those two cases. In both of cases, a number of male nematodes were less than a number of female nematodes. In the first one 1 male and 4 female nematodes were seen. In the second one 4 male and 21 female nematodes were observed. Female nematodes had barrel-shaped eggs with polar plugs and male nematodes had spicule. A high number of free eggs were observed in intestine of fish. Regarding morphological characteristics of the nematodes and their eggs they were identified as *Capillaria* sp. (Figures 1, 2, 3 and 4).



Figure 1. A female *Capillaria* sp. ( $\times 40$ ).

The treatment with levamisole was effective and the loss (50 fish per day before the diagnosis and treatment) was terminated. And checking of fish until two months after treatment showed no mortality in fish.

Studies on parasites of ornamental fishes in Iran are few. Studies on ectoparasites of ornamental fishes in Iran were done more frequently than the ones on endo-parasites. In a study on imported ornamental fish in Iran, some ectoparasites were observed from discus (*Symphysodon aequifasciatus*), but no report on endo-parasites of *S. aequifasciatus* had been reported in that study (Mehdizadeh-Mood, 2009). In a study on parasitic infestation of aquarium fishes of Tehran province in Iran conducted in 2004 and published in 2006, infestation with the one (*Camalanus* sp.) was reported in *Heros severus* (Meshgi et al., 2006). Studies on parasites of ornamental fish in the world were performed more

frequently than in Iran. In Brazilian Amazon River (origin of some fish of *Cichlidae*) *Procamallanus* sp. was reported (Tavares-Dias, 2010). In a study on parasites of ornamental fish in Turkey, *Capillaria* sp. was reported from discus (Erkin, 2009). Thilakaratne et al. (2003) in a study on parasitic infections in freshwater ornamental fish in Sri Lanka had reported *Capillaria* sp. in guppy (*Poecilia reticulata*) and angel (*Pterophyllum scalare*).

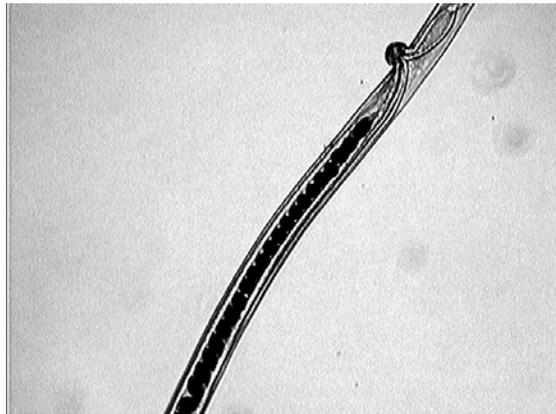


Figure 2. Vulva region of female *Capillaria* sp. ( $\times 100$ ).

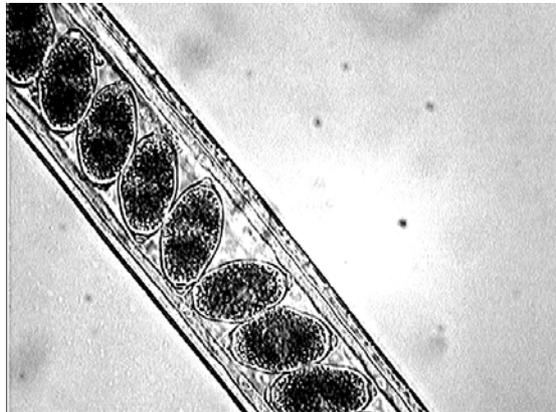


Figure 3. Immature and barrel-shaped eggs with polar plugs of female *Capillaria* sp. ( $\times 400$ ).

Most of ornamental fishes like discus (*S. aequifasciatus*) come from tropical countries. Capillarid nematodes are frequent parasites in both freshwater and marine fishes (Moravec et al., 1988). However, these ornamental fishes are

infected with the introduced helminth parasites in aquarium. These helminthes may cause a high mortality in aquarium fishes. For example *Capillaria pterophylli* Heinze, 1933 is known to cause a high mortality in aquarium-kept cichlides (Moravec et al., 1999).

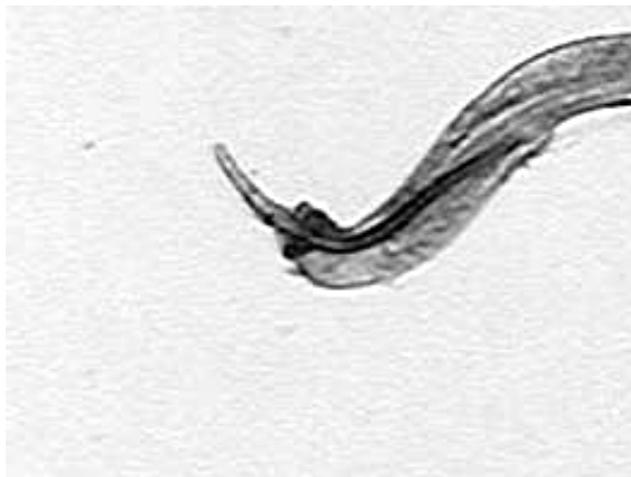


Figure 4. Caudal end of a male *Capillaria* sp. with spicule ( $\times 100$ ).

Results of our study were similar regarding mortality of *Capillaria pterophylli*. Our study and previous studies show that import of new helminth or newly infected fish with some helminthes can cause a high mortality in cultured fishes.

### Conclusion

This study showed that infection with some species of *Capillaria* can cause a huge loss in ornamental fish from *Cichlidae*. Therefore, other studies on these nematodes and other nematodes are necessary for diagnosis and treatment of great loss of *Cichlidae* or of other fishes. Similarly, a diagnosis of parasites of these fishes can help us to prevent mass mortalities.

### Acknowledgements

Authors especially wish to thank Mr Mahmudi, a technician of the laboratory of Aquatic Animal Health, the Faculty of Veterinary Medicine, the University of Tehran, Tehran, Iran.

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Received: May 7, 2011  
Accepted: May 23, 2011

KAPILARIOZA KOD DISKUS RIBA  
(*SYMPHYSODON AEQUIFASCIATUS*) U IRANU

**Hooman Rahmati-holasoo<sup>1</sup>, HosseinAli Ebrahimzadeh Mousavi<sup>1\*</sup>,  
Mehdi Soltani<sup>1</sup>, SeyedHossein Hosseini<sup>2</sup>, Masoomeh Ghadam<sup>1</sup>  
i Reza Samani<sup>3</sup>**

<sup>1</sup>Univerzitet u Teheranu, Fakultet veterinarske medicine, Odsek za zdravlje vodenih životinja, P.O. Box: 14155-6453, Teheran, Iran

<sup>2</sup>Univerzitet u Teheranu, Fakultet veterinarske medicine, Odsek za parazitologiju, P.O. Box: 14155-6453, Teheran, Iran

<sup>3</sup>Univerzitet u Teheranu, Fakultet veterinarske medicine, Odsek za patobiologiju, P.O. Box: 14155-6453, Teheran, Iran

R e z i m e

Svetska trgovina dekorativnim ribama je industrija koja brzo raste. Gajenje i razmnožavanje dekorativnih riba se poslednjih dvadeset godina povećava u Iranu. Diskus (*Symphysodon aequifasciatus*), predstavnik *Cichlidae* je jedna od najpopularnijih i najskupljih akvarijumskih riba. Poslednjih nekoliko godina gajenje ove ribe je dobro razvijeno u Iranu. Dve diskus ribe iz dva različita centra su bile poslate laboratoriji za vodene bolesti Veterinarskog fakulteta Univerziteta u Teheranu zbog znakova anoreksije, gubitka ravnoteže, slabosti i tamne kože (sa velikim mortalitetom). Posle pretrage na ektoparazite obavljen je postmortem pregled u optimalnim uslovima, pripremljena bakterijska kultura sa standardnim medijumom i izdvojen alimentarni kanal. Kod obe ribe ektoparaziti nisu nađeni i bakterije nisu rasle na standardnim medijima. Ispitivanjem unutrašnjosti svake ribe nađeno je 5-25 nematoda. Prema morfološkim karakteristikama nematoda i njihovih jaja, identifikovane su kao *Capillaria* sp. Tretiranje drugih riba sa levamisalom je bilo efikasno i gubici su bili zaustavljeni. Neke gliste kao *Capillaria pterophylli* Heinze, 1933 mogu da izazovu veliki mortalitet kod ciklidnih akvarijumskih riba. Ova ispitivanja su pokazala da infekcija sa nekim vrstama *Capillaria* može da izazove velike gubitke kod ciklida. Dijagnoza parazita kod ovih riba može da pomogne sprečavanje visokog stepena mortaliteta.

**Ključne reči:** diskus, nematode, *Capillaria*, levamisol, Iran.

Primljeno: 7. maja 2011.

Odobreno: 23. maja 2011.

\* Autor za kontakt: e-mail: hmosavi@ut.ac.ir