



Frequency of ectoparasite infestation Siamese fighting fish (*Betta splendens*) in Qom province in Iran

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Abstract

In summer of 2018, number of 100 Siamese fighting fish (*Betta splendens*) were sampled randomly and transferred with their own water with aerated bags to ornamental fish clinic of Faculty of veterinary medicine of University of Tehran. Then wet mount from skin and gills of the fish were prepared and were examined with a e600 microscope. In total, the prevalence of parasitic infections in skin and gill was 37%. 9 were infected with *Ichthyophthirius multifiliis* (9%) and 28 were infected with *Piscinoodinium* (28%). No fish were infected with other ectoparasites. For treatment of the fish infected with *Ichthyophthirius multifiliis* fish were submerged in water with 2% NaCl for an hour and then their water was gradually (in 10 days) heated up to 31°C. For treatment of the fish infected with *Piscinoodinium* we only heated the water up to 31°C in 10 days and kept the fish in darkness. After 2 weeks fish were sampled from their skins and gills and no infestation were observed.

Keywords: Siamese fighting fish, *Ichthyophthirius multifiliis*, *Piscinoodinium*

INTRODUCTION

Fish are an essential source of protein for humans, no need to mention that how important they are to fishing and keeping fish as ornamental fish. The progress of aquaculture in recent decades has led to more attention to the problems that parasites cause to the industry (Kennedy 1994a). beside mortalities parasites can have a significant impact on growth, fish behavior, their resistance to stress and even vulnerability to predators. The presence of parasites may also reduce the marketability of fish as well.

Parasitic diseases are the most common infectious diseases in aquarium fish. Fish parasites are highly diverse and include protozoa, trematoda, Turbellaria, nematoda, cestoda, leeches, acanthocephala, monogeneans, pentastomes (tongue worms), copepods and crustaceans. The life cycle of parasites is either straight and does not require an intermediate host or complex and indirect that requires one or more intermediate hosts. Fish may be the final, incidental, and intermediate host of the parasitic cycle. Understanding the life cycle of the parasite is essential for successful and effective treatment. For example, only the swimming stage of the parasite (Theront) *Ichthyophthirius multifiliis*, a common external ciliate parasite, is sensitive to chemical treatments.

Most parasites enter the enclosed environment due to inappropriate quarantine. Other methods of entry include defective disinfectant of live plants, equipment and supplies, contaminated water supplies, wild birds, frogs and turtles in outdoor ponds, and tiny droplets between aquariums. Proper implementation of biosecurity including quarantine protocols can reduce the likelihood of exposure.

MATERIALS AND METHODS

In summer of 2018, number of 100 Siamese fighting fish (*Betta splendens*) were sampled randomly and transferred with their own water with aerated bags to ornamental fish clinic of Faculty of veterinary medicine of University of

Tehran. Then wet mount from skin and gills of the fish were prepared and were examined with a e600 microscope.

RESULTS

In total, the prevalence of parasitic infections in skin and gill was 37%. 9 were infected with *Ichthyophthirius multifiliis* (9%) and 28 were infected with *Piscinoodinium* (28%). No fish were infected with other ectoparasites. (chart 1) For treatment of the fish infected with *Ichthyophthirius multifiliis* fish were submerged in water with 2% NaCl for an hour and then their water was gradually (in 10 days) heated up to 31°C. For treatment of the fish infected with *Piscinoodinium* we only heated the water up to 31°C in 10 days and kept the fish in darkness. After 2 weeks fish were sampled from their skins and gills and no infestation were observed.

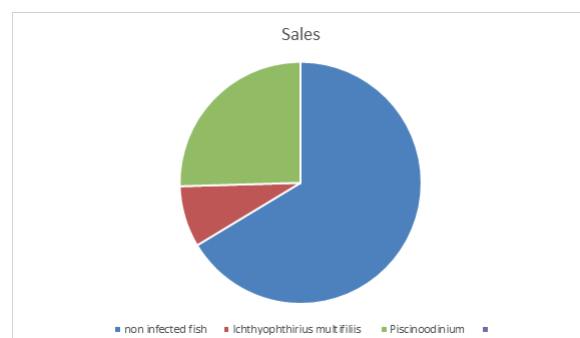


Chart 1. Frequency of external parasites in the experimental Siamese fighting fish.

DISCUSSION AND CONCLUSION

Outbreaks of external parasites have been reported from most parts of the world (). As an example In 2013, Nematollahi et al. Reported infection with *Ichthyophthyrus*, *Trichodina* and *Dactylogyrus* on some carp ponds in Mashhad fish farms (). Ich is one of the most common diseases of freshwater fish (Matthews 2005). Virtually all freshwater fish are susceptible to infection, although scaleless fish, such as catfish and loaches, are especially vulnerable. Up to 100% mortality may occur (Meyer 1974 ; Dickerson 2006). Ich is typically a warm water disease and a common temperature for ich outbreaks is 15 – 25 ° C (59 – 77 ° F). Parasites complete their life cycle in 3 – 6 days at 25 ° C (77 ° F), 10 days at 15 ° C (59 ° F), and a month or more at 10 ° C (50 ° F), when the disease is typically less serious (Meyer 1974).

Due to the specific cycle of the parasite and the penetration of the parasite into the fish's skin during life stages, drug therapy is only effective on the free form of the parasite. Treatment should be repeated several times depending on the temperature of the water and it is very difficult to eradicate the disease. It is suggested that formalin is effective as an early treatment to prevent transmission of the parasite from fish to fish during the early stages of an outbreak, but that it is less effective against severe and extensive infections (Matthews, 2005). Many chemicals and drugs have been tested or used for the treatment of *I. multifiliis* including copper sulfate (Straus, 1993; Straus et al., 2009), potassium permanganate (Straus and Griffin, 2002), chloramine T (Cross, 1972), sodium percarbonate, garlic (Buchmann et al., 2003) and others (Matthews, 2005). Bronopol has been shown to be efficacious in the control of *I. multifiliis* infection in rainbow trout (Shinn et al., 2003). Efficacy and toxicity varies among fish species and water quality (Straus and Griffin, 2002; Straus et al., 2009).

Many tropical fish are susceptible to *Piscinoodinium*, with anabantids, cyprinids, and cyprinodontids frequently affected. Temperate species (e.g., common carp, tench) and larval amphibians (*Amblystoma mexicanum* , *Rana temporaria* , and *R. arvalis*) are also susceptible (Geus 1960). Mass mortalities in tank - reared tilapia have been associated with decreasing temperatures (dropping from 30 ° to 21 ° C; Ramesh et al. 2000), but epidemics in pond - cultured fish have been observed with both increasing and decreasing temperatures (Shaharom - Harrison et al. 1990). They are easier to treat and eradicate. Strict Quarantine Protocol and Periodic Disinfection Can Prevent Parasitic Diseases and Their loss.

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