# *Lernaea – The Hidden Threat to Ornamental and Farmed Fish*

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**ABSTRACT**

*Lernaea* which is known as anchor worm exists as an ectoparasite that infects both ornamental and farmed freshwater fish species. The females attach themselves to skin and fins and gills to suck blood and tissue which leads to skin discomfort open wounds, stress, diminished growth and secondary infections. The organism produces free-swimming larvae which find hosts while its stationary females generate eggs during the entire time which results in fast population growth. The infestations appear as thread-like formations which makes them easy to identify. Management practices need to combine chemical applications with physical removal methods and water quality enhancement and fish welfare improvement.

## INTRODUCTION

Aquaculture and the ornamental fish trade are rapidly expanding globally but parasite infestation is one of the limiting factors for sustainable production. Of these, *Lernaea*, (commonly referred to as the anchor worm), is a major external parasite of ornamental and farmed fish. This is a copepod ectoparasite causing lernaeosis It belongs to the genus *Lernaea* of the Lernaeidae family (Hua *et al*., 2019). The parasite anchors its head securely to all exterior parts of the fish, including some internal parts such as the mouth, gills, gill filaments, or even the eyes (Woo & Shariff, 1990). Upon attachment, it

takes a blood meal and siphons host fish blood and body fluids resulting in irritation, lesions, and stress to the host fish. *Lernaea* infestation is unsightly not only in ornamental fishes, but also in aquaculture. The parasite debilitates fish, reduces growth and marketability and creates open sores that could be entry points for secondary bacterial and fungal infections. Heavy infection of *lernaea* may leads to high mortality in the case of young ones. The risks intensify because of environmental elements which include poor water quality together with large population densities and stressful conditions. The parasite *Lernaea* presents a hidden threat to fish health because it infects multiple hosts while spreading quickly and surviving well in water environments. Knowledge of its biology, significance, and control is important in the support of healthy stock in both the ornamental and commercial aquaculture industries.

**Life Cycle of *Lernaea* – How It Grows and Spreads**

The *Lernaea* (anchor worm) life cycle is both fascinating and detrimental to fish. The larvae start their development by passing through several stages which scientists call nauplius and copepodid until they find a fish host. The female worm transforms into a parasite after attachment where it extracts blood and tissue from the fish by inserting its head deep into skin or gills of fish. The females who remain anchored continue to produce eggs but the males remain unanchored and die soon after they reproduce. The cycle begins again when the eggs produce new larvae. The *Lernaea* parasite spreads quickly through aquaculture systems because it produces offspring continuously which makes control efforts extremely difficult.

**Morphology of *Lernaea***

*Lernaea* shows a body structure that stands out from other species. The female stage of fish exists as the most common stage which people commonly observe. Their body takes on a lengthy thread structure which usually spans between 5 and 12 millimetres. The front portion of the body contains a specialized anchor-shaped head structure called cephalothorax which inserts deeply into the fish's body tissues. The parasite stays attached through this anchoring system while it feeds. The fish displays a clear trunk which extends from its head area. The parasite develops two lengthy egg sacs at its back end which form a "Y" shape. Males, in contrast, are much smaller, free-living, and rarely seen on fish.

Image Credit: the U.S. Geological Survey

**Signs And Effects on Fish Health**

*Lernaea* are visible with the naked eye; *lernaea i*nfestations are frequently simple to identify. The parasites show up as thin greenish-white threads which extend from the gills and fins and skin of the fish. The wound attachment sites develop inflammatory wounds and ulcers which produce red sores. Fish that are infested frequently show signs of restlessness while they use objects to relieve their discomfort. The parasite feeds on blood and bodily fluids which causes the host to lose strength while showing symptoms of reduced eating and stunted growth and body mass decrease. The condition will become worse and this will lead to bacterial and fungal infections in the affected area. *Lernaea* infestations threaten fish health and

aquaculture production as they lead to anaemia and stress and sometimes result in fish death.

**Host and Distribution**

*Lernaea* is a common parasite which infects numerous freshwater fish species throughout the entire world. The parasite occurs frequently in carp and goldfish and guppies and gouramis and catfish along with several other cultured and ornamental fish species. The parasite spreads easily through ponds and lakes and aquariums because it can live on various hosts. Warm climate conditions create an environment where infestations become common because these conditions enable pests to reproduce at a fast rate. The combination of high fish density in aquaculture ponds enables disease outbreaks to spread effectively. It has the ability to attack very broad range of hosts; this creates a severe problem for the both ornamental and farmed fishes.

**Treatment and Control**

Treatment and control of managing *Lernaea* requires both direct treatment of the parasite and improvement of the culture environment. The only way to get rid of individual parasites from aquarium fish requires manual extraction with tweezers. The common chemical treatments for ponds include potassium permanganate and formalin and salt baths. The medication organophosphates including trichlorfon undergo usage in regulated environments. (Noga, 2010). The treatment process requires precise execution because it must protect both fish health and water environmental cleanliness. The female *Lernaea* produces hundreds of eggs which makes it necessary to perform multiple treatment sessions. The control program requires two essential components which include medication use and water quality improvement and fish stress reduction and proper hygiene maintenance.

## CONCLUSION

*Lernaea* infestation creates a major problem for commercial and ornamental aquaculture because it damages fish health while slowing their growth and making them more vulnerable to secondary opportunistic pathogens. Controlling of *lernaea* in freshwater environment is challenging due to its ability to infect multiple hosts and a quick offspring production rate within intensive fish culture. The management process requires early detection along with proper treatment, stress reduction and water quality improvement to succeed.

## REFERENCE

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