

# An Overview of *Argulus* (Fish Lice) Infestation in Fish Ponds

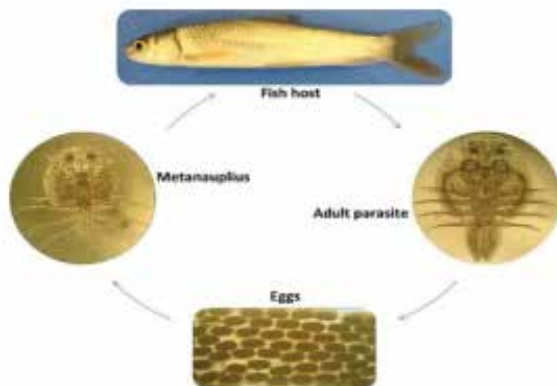


# An Overview of *Argulus* (Fish Lice) Infestation in Fish Ponds

-Vijay Sundar Deva G  
Assistant Product Manager - Blunova  
Provet Pharma Pvt Ltd.

## Introduction

Aquaculture has emerged as a promising enterprise to retain with the growing demand for high-quality protein food in an ever-growing world population along with generating employment and income for rural people. With the increasing intensiveness of the aquaculture practice to increase the fish production, stress level on fish is also increasing, resulting in compromised immunity of stocked fish which leads to outbreak of infectious. Among infectious mediators, the parasites are in general considered opportunistic infectious agent and highly viable under intensified culture conditions. The cultured aquatic animal harbour's a diverse group of parasites; however, manifestation with ectoparasites is ubiquitous in the aquatic environment. *Argulus* are crustacean macro-ectoparasites that create one of the major threats to the aquaculture due to lack of suitable therapy. Argulosis causes a potentially rapid escalation of infection, causing substantial economic loss to the aquaculture industry worldwide. The use of chemotherapeutics/drugs/chemicals is a routine activity to combat argulosis in aquaculture; however, it has numerous unavoidable drawbacks; therefore, treatment would hardly be feasible with the existing methods.



Life cycle of Fish Lice (*Argulus sp.*)

## Life cycle of Fish Lice - *Argulus sp.*

*Argulus* is a louse-like parasite having a flat body generally called the fish louse. One of the most widespread crustacean ectoparasites of freshwater fish in the world. *Argulus* has a direct life cycle, meaning it only requires one host (the fish) to completely develop from an egg to a mature, reproducing adult. The adult female parasite leaves the host to lay eggs. then it lays sticky eggs on the submerged vegetation, rocks, sticks, etc. The female dies after spawning. The nauplius, metanauplius and in some species the 1st copepod stages develop within the eggs and hatch as metanauplii or copepods. Other development stages are 2nd to 7th copepodid and finally adult. All free-living stages are parasitic to fish. The minimum period required for life cycle completion varies from 3-6 weeks.



Image 1: Rohu (*Labeo rohita*) heavily infested with *Argulus sp.*



Image 2: Microscopic examination of Larval stage of *Argulus* (Fish Lice)

## Scenario of *Argulus sp.* in aquaculture:

Modern fish culture practices generally operate on high stocking densities and creates a favourable environment for infectious diseases and transmission and reproduction of parasites. *Argulus* parasitizes the skin, fins, and gills of host fish and feed on mucus, epidermal cells, and blood leading to dermal ulceration, physiological stress, and immune suppression. The lesions caused by parasites due to blood sucking result in secondary infection with opportunistic pathogens like bacteria and fungus. It secretes certain secretory/excretory proteins (SEP), which help the parasites in attachment with host, tissue digestion, extraction of nutrients, and establishing an infection. Heavy infestations cause severe skin damage, pinpoint haemorrhages, anaemia, fin and scale loss, increased mucus production, lethargy, erratic swimming, and poor body condition and mortality. In a severe infection, fish skin, fins, belly flaps, and head loaded with fish lice make the fish unpleasant or obnoxious, reducing consumer preference and marketability. This situation thus demands efficient antiparasitic drug or managerial measures to tackle argulosis for aquaculture sustainability.

## Economic importance of Fish Lice – *Argulus sp.*

*Argulus* are crustacean macro-ectoparasites that create one of the major threats to the aquaculture due to lack of suitable therapy. *Argulus*, locally called fish lice, is one of the most dreadful crustacean macro-ectoparasites that cause the disease Argulosis, a severe growing concern to the aquaculture industry worldwide. Argulosis is responsible for epizootic outbreaks and is a serious economic concern in all phases of the aquaculture sector, from production to marketing. The fish lice is a prolific breeder with a direct life cycle but comprising several metamorphic stages in their life cycle such as eggs, metanauplius, copepodid, juvenile, and adult stages, and all stages except eggs are infective to fish. The infection leads to reduced appetite, weight loss, and anaemia in fish resulting in morbidity and mortality in the chronic stage of heavily infested fish. The intensity of fish lice is very low with less of a threat in the wild fish than to those in captive conditions at all the stages of fish and exerts massive financial insecurity.

## Conclusion:

*Argulus sp.* infestations of freshwater food fishes. Fish lice are branchiurid ectoparasites capable of inflicting serious pathological effects on freshwater fishes. Little is known on the present status of fish lice in freshwater food fish in India. It has shown that *Argulus sp.* are found parasitizing economically important species of fish in India, determined the species of fish lice are present and which species of fish they infect, and described the parasite populations found on infected fish species.

## Prevention:

Because of potential challenges with controlling this parasite, especially in food and pond fish, biosecurity measures should be instituted and followed to minimize introduction or transmission to other ponds, systems, or facilities. Incoming fish, particularly wild-caught or pond-raised stock, should be quarantined, observed, and sampled in order to minimize the risk of introduction. *Argulus* outbreaks, once recognized, should be managed quickly. Source water should be evaluated to ensure that is not a pathway for introduction of argulid eggs. Ideally, water should be filtered or obtained from a fish-free and *Argulus*-free source.

## Control and Treatment:

1. Ectocyp – 100ml/acre in 5 feet depth of the fish pond.
2. Mectimax – 10ml/100kg fish body weight for 4-5 days with feed.



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