

Enriched Live Food and it's Important on Larval Rearing of Fish

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ABSTRACT

Aquaculture is the fastest-growing food-producing sector, accounts nearly 50 percent of the total world's fish production. This sector is the important livelihood and source of food and nutrition security for millions of people all over the world. Fish is the cheapest source of animal nutrition such as protein, lipid as well as Omega-3 fatty acids. In India, freshwater aquaculture has become a commercial venture and the most preferred group of species for culture is Indian major Carps and Catfishes due to high demand. But the main problem is the lack of seed availability because of problems in early larval survival.

Keywords: Live food, Larval rearing, HUFA, Vitamin-C.

Introduction

Live fish food organisms include both plants (chlorella, volvox, and scenedesmus) and animals (earthworms, sludge worms, bloodworms, water fleas, and feeder fish). They are very important for fishes during different life stages. Live food like Infusoria, Daphnia, Moina, Rotifers, and newly hatched *Artemia nauplii* are very crucial for fish larvae and fry. Live food organisms contain all types of essential nutrients including proteins, lipids, carbohydrates, vitamins, minerals, amino acids, and fatty acids. They are commonly known as living capsules of nutrition (Das *et al.*, 2012). The Rotifers and Cladocerans have been widely accepted as a starter food for larval stages of many fishes (Gogoi *et al.*, 2016). Rotifers are the preferred live food for the fry and fingerling stage because of their bigger size and passive movement. The fish larvae have more preferences towards cladocerans because of their small size and jerky

movement. It is to make them more visible to fish larvae. The cladocerans also known as water fleas include two genera *Daphnia* and *Moina*. The *Moina* is the most preferred live food for the fish larvae than *daphnia* and is easy to mass culture throughout the year.

Highly unsaturated fatty acids (HUFA)

Highly unsaturated fatty acids (HUFA) such as docosahexaenoic acid, eicosapentaenoic acid, and arachidonic acid are important fatty acids for fish larvae. They could improve the growth, survival rate, pigmentation, and stress resistance. The enrichment of live feeds with these essential fatty acids can increase the larval survival of fishes.

Vitamins C

Vitamins are also one of the essential nutrients for the early stages of fish larvae. Vitamin C (Ascorbic acid) is an essential vitamin that cannot be synthesized in the fish body. Vitamin C incorporation in larval diets would lead to enhancing survival rate, growth performance, skeletal development, stress resistance, and immune response (Singh *et al.*, 2019).

Live food as a larval feed

Live food is used as a larval feed to help for the highest survival of the larval stage of fish. Some researchers have reported a live food for the best survival of larval rearing period of larvae. Singh *et al.* (2019) observed the better survival of *Anabas testudineus* larvae after feeding with HUFA and vitamin C enriched *Moina*. The highest survival with HUFA enriched *Moina* was recorded $24 \pm 1.53\%$ and while the lowest survival ($9.3 \pm 0.88\%$) was in the control unit. Sontakke *et al.* (2019) recorded the highest body weight (4.59 ± 0.17 g) and survival (72.66 ± 2.90 %) of *Notopterus chitala* fry after the feeding with enriched *Artemia*. Araújo *et al.* (2016) observed the highest survival ($86.92 \pm 6.01\%$) of *Prochilodus lineatus* larvae after feeding with docosahexaenoic acid (DHA) and arachidonic acid (ARA) enrich *Artemia*. Action-Nzeh *et al.* (2012) observed the higher survival (95%) and growth rate ($6.41 \% \pm 1.59$) of *Clarias gariepinus* larvae after the feeding with *Artemia nauplii* and formulated diets. Okunsebor *et al.* (2011) reported a higher survival rate (88.83%), percentage weight gain (4.96%), and specific weight gain (3.09) of the *Heteroclaris* fry after the feeding with live *Moina micrura*.

Conclusion

Live food is used as a larval feed to help for the highest survival of the larval stage of fish. The fish larvae have more preferences towards cladocerans because of their small size and jerky movement. It is to make them more visible to fish larvae. The most preferred group of species for culture is Indian major Carps and Catfishes due to high demand. HUFA and vitamin C enriched live food is a very useful larval feed for fish.

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