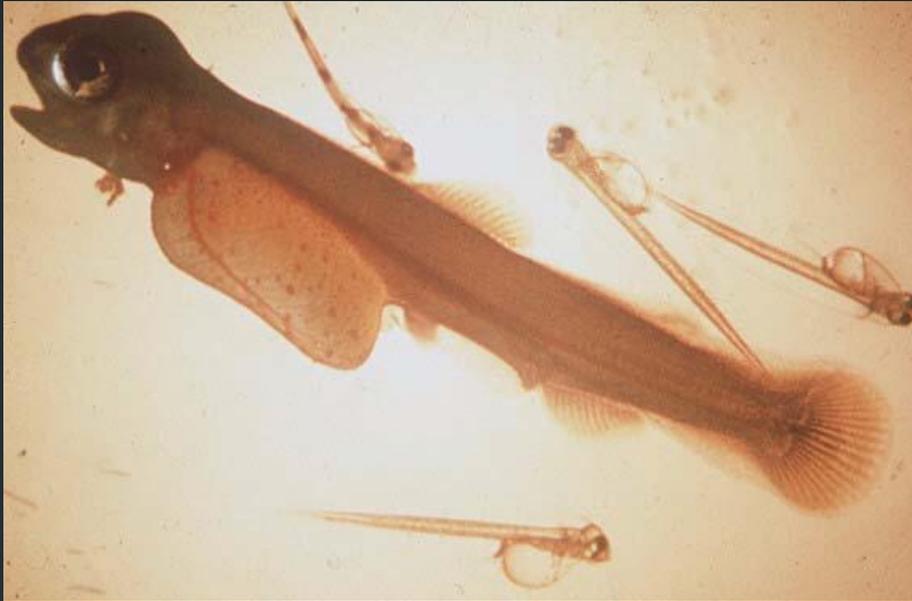
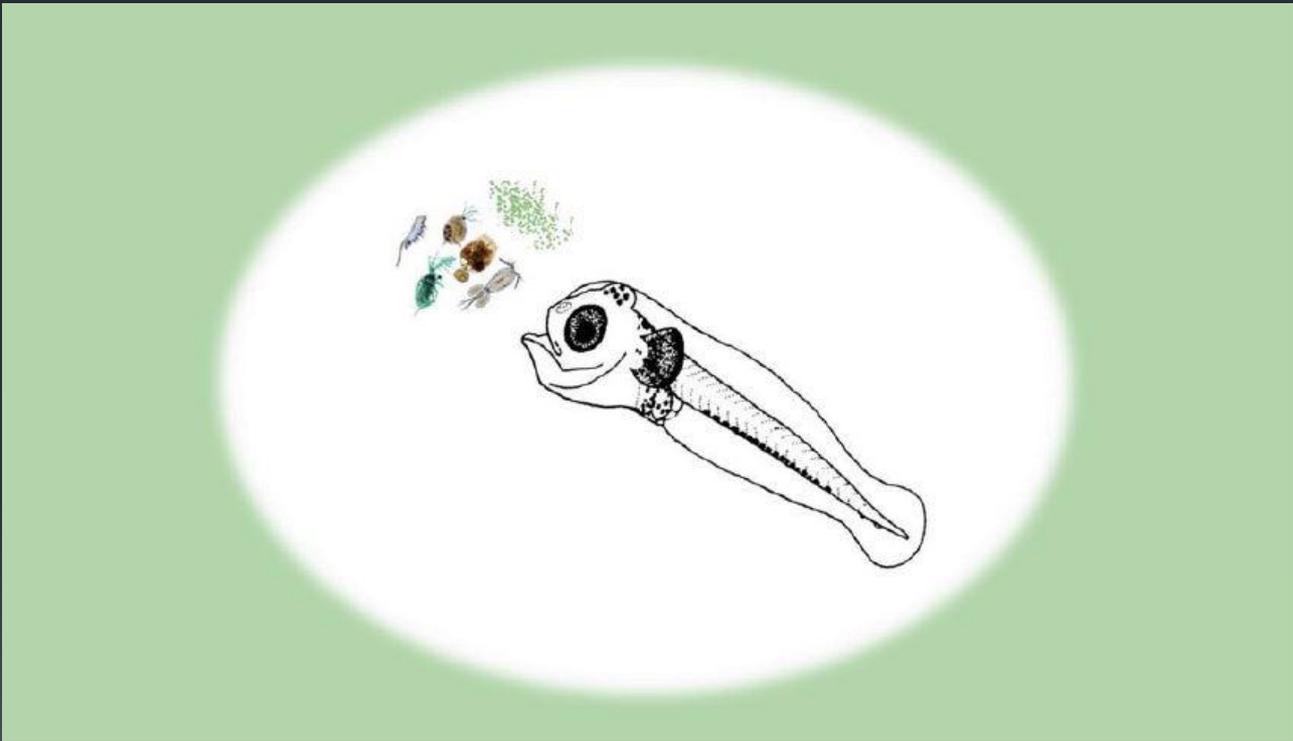


# Fish Food Organisms







# FISH FOOD ORGANISMS IN LARVAL REARING

## Introduction

- Larval phase of fishes, prawns or any other aquatic species is the 'most critical phase of their life.'
- This phase needs tender care including nutritional care for better growth and survival.
- In nature various types of phyto and zooplankton serves the required nourishment to the larvae of fish and prawn.
- Live food organisms not only a wide spectrum composition of food but also facilitates better ingestion, digestion and assimilation of nutrients in the larvae.
- So the live food organisms are called the ' Living Capsules of Nutrition' for fish and prawn larvae.

# Algae

- Algae are chlorophyll bearing unicellular or multi-cellular plants. When multi-cellular, they may be colonial or filamentous.
- According to the nature of photosynthetic pigment pigments the algae are further classified into three divisions viz.-
  - Chlorophyta—The green algae
  - Phaeophyta --The brown algae
  - Rhodophyta – The red algae
- Green algae serves as initial food producers and are the 1<sup>st</sup> link in aquatic food chain.

# Algae

- Use of micro-algae as a possible source of protein for human consumption was recognized in mid of 20<sup>th</sup> Century with production of single cell protein (SCP ).
- Later-on the other use of algae were also recognised viz waste water treatment, nutrient recycling, bio-conservation of solar energy etc.
- In recent years unicellular algae such as diatoms (Chaetoceros and Skeletonema) and small phytoplankters (Isochrysis and Chlorella ) are widely used in aqua-hatcheries for feeding the larval stages of fishes, prawns, shrimps & molluscs.

# Algae

- This is because their small size (5-25micron) is suitable for early developmental stages of various aquatic life and also due to their nutritional value.
- Micro-algae are important source of food for live food organisms as well like rotifers, copepods, cladocerans and artemia etc.
- Importance of micro algae as larval food is also because it stimulates enzymatic synthesis on on-set of feeding in young larvae.

# Infusoria

- Infusoria refers to microscopic single celled animalcules belonging to the Class Ciliata of Phylum Protozoa.
- They are very small, soft bodied and highly nutritious animalcules.
- Ideal starter feed for early larval stages of fishes
- **Paramecium** and **Stylonychia** are the most common forms of freshwater infusoria.
- **Fabrea** and **Euplotes** are common marine forms of infusoria.

# Rotifers

- Popularly called as “**wheel animalcules**”, rotifers are an important group of live food organisms for aqua hatcheries.
- **Brachionus** is the most common rotifer and serves “**starter feed**” for larval stages of many fish and prawn spp.
- Rotifers varies from **50-200 microns** in size and are accordingly used as live food organisms depending on the mouth size of the cultured animal.

# Artemia



- Artemia is most widely used live feed in aquaculture hatcheries.
- It belongs to Phylum Arthropoda, Class Crustacea and Order Anostraca. It is closely related to shrimps.
- The biggest plus point of using Artemia is that one can produce this live food **'on demand'** from its dry cysts available commercially.
- Dormant Artemia cysts when immersed in sea water regain their metabolic activity to produce nauplii (0.4mm) within 24 hrs.

# Artemia cont..d

- All stages of Artemia i.e.
  - De-capsulated cysts,
  - nauplii,
  - juveniles
  - adults are used as feed.
- Also the frozen adult Artemia is used by aquarists, fish breeders and aqua-culturists.
- Artemia has high nutritive value and high conversion efficiency.
- In some countries it is even used for human consumption.
- Commonly Known as **Brine Shrimp**.

# Cladocerans

- Cladocerans are commonly called '**Water fleas**'.
- Is of Phylum Arthropoda, Class Crustacea, Sub-class Branchiopoda and Order Cladocera.
- The most important cladoceran used as live feed are **Daphnia** and **Moina**.
- Daphnia being larger in size serves as live food for **advance stages of fishes**.
- Moina is rather small in size (0.5-2.0mm) than Daphnia and contains 70% protien so it goes well as a replacement for Artemia in aqua hatcheries.

# Tubifix

- Tubifix is a type of worm belongs to to Phylum Annalida and Class Oligochaeta .
- Clusters of these worms are commonly seen in sewage drains and they hide themselves in mud on disturbance.
- They are **not suitable for larval stages** but are ideal live food for magur and ornamental fishes.
- Commonly Called **Sludge Worm.**

# Chironomid larvae

- Chironomus is an insect belonging to the Order Diptera of Class Insecta and phylum Arthropoda.
- The larvae of this insect make a staple item of food to the young ones of all carnivorous fishes.
- Commonly Called as **Blood Worms**