

Algal Storage

Algal cultures may be stored for extended periods in 2 forms: as a frozen concentrate or a freeze-dried powder. The processing of algae for storage in a frozen form by adding cryoprotective agents is known as cryopreservation.

ZOOPLANKTON

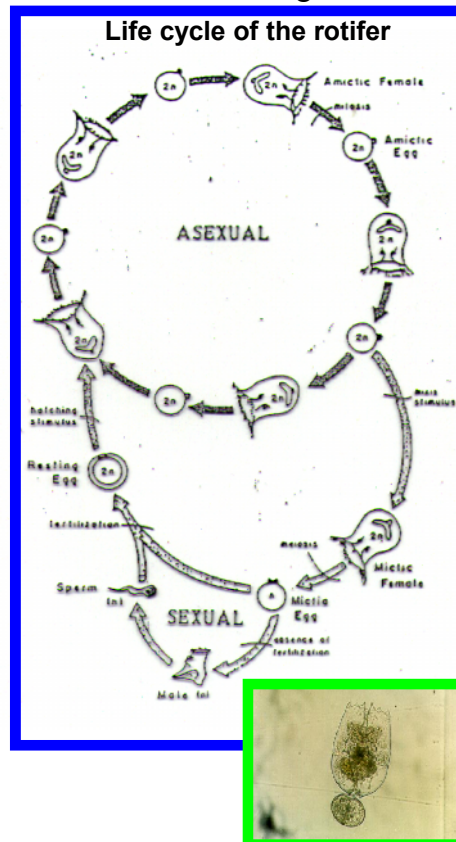
The animal component of the plankton often referred to as herbivores or “grazers” feeding heavily on the plant component is the zooplankton. It is a very important and indispensable food for marine and freshwater fish larvae. With many species belonging to Class Rotifera, the most suitable for mass culture is *Brachionus plicatilis*.

The body of rotifer is divided into 3 portions: head, which carries a crown surrounded by cilia; trunk; and foot. Rotifer's size ranges from 100 to 400 μm .

B. plicatilis may undergo two types of reproduction depending upon the culture condition. To increase the population density of the rotifers, it is necessary to keep them in the asexual reproduction phase by excluding the factors, which induce sexual reproduction of rotifers in mass cultures.

B. plicatilis is a fastidious feeder, the most tested acceptable food given are *Chlorella sp.* and *Tetraselmis sp.* with an addition of baker's/marine yeast.

In freshwater, *B. calyciflorus* and *B. rubens* are the most common rotifers for mass culture. They are fed with *Phytoplankton Scenedesmus sp.* and *Chlorella sp.*, as well as yeast and the artificial diet can also be applied.



CULTURE OF NATURAL FOOD ORGANISMS FOR FISH HATCHERIES

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INTRODUCTION

The natural diet of most aquaculture fish and shellfish species consists of wide diversity of phytoplankton and zooplankton organisms which are found in great abundance in the natural environment. Collection or production of selected species of plankton is done in hatcheries to supply sufficient natural food to newly hatched larvae.

The availability of live food organism in the water determines the success of fish farming. In larval tanks and nursery ponds, the presence of live food organisms in appropriate quantities and sizes influences the growth and survival of the fry. Formulated feeds can not meet the food requirements of the fish and may result to significant mortality.

Today, more than 40 different species of micro-algae, isolated in different parts of the world are cultured as pure strains in intensive systems. At the National Integrated Fisheries Technology Development Center (NIFTDC), live food production includes phytoplankton such as *Nannochloropsis sp.*, *Tetraselmis batan*, *Chaetoceros sp.*, etc. and zooplankton like *Brachionus plicatilis*.

PHYTOPLANKTON

Species : *Nannochloropsis sp.*, *Tetraselmis batan*, *Isochrysis galbana*, *Chaetoceros sp.*, *Pavlova lutheri*

Physical and Chemical conditions

The most important parameters regulating algal growth are nutrient quantity and quality, light, pH, turbulence, salinity, and temperature.

a. Culture Medium/Nutrients

Like higher plants algae requires at least 15-20 elements for normal growth and reproduction. They are the macronutrients and micronutrients.



b. Light

Light is the source of energy for photoautotrophic algae. The requirements of light vary with the culture depth and the density of the algal culture. Light may be natural or supplied by fluorescent lamp.

c. pH

The pH range for most cultured algal species is between 7 and 9, with 8.2-8.7 as optimum range.

d. Aeration/Mixing

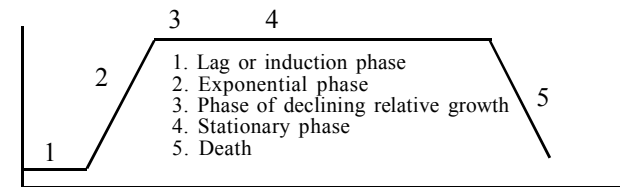
Mixing is necessary to prevent sedimentation of the algae. It is achieved by stirring daily by hand for small volume, aerating for bigger volumes or using paddle wheels and jet pumps for ponds.

e. Temperature

Phytoplankton increases their growth rate with increasing temperature up to an optimum level after which growth rate declines, often abruptly. The optimal temperature for the culture of phytoplankton is between 18-25 C.

Growth Dynamics

With suitable enrichment and favorable physical conditions, algal cultures will exhibit growth which is characterized as having 5 phases:



Sterilization

In culture systems employing gradually, culture volumes, the maintenance of axenic base or stock cultures is required. It is not practical to sterilize all production levels. Usually only smaller volumes of seawater are treated by autoclaving. In large volume cultures, use of oxidizing agent like chlorox applies.

Counting/Analysis of Algal Cultures

Analysis of algal cultures for feeding purposes involves visual inspection of the cultures. In most cases, the hemacytometric technique is employed. Daily counting is done.