

HATCHING OF ARTEMIA CYST

Introduction

Artemia is commonly called as “Sea Monkey” or “Brine Shrimp” which thrives in hyper saline waters and is distributed worldwide. It lives in temperature of $>35^{\circ}\text{C}$, upto 340ppt of salinity and $<1\text{ppm}$ of dissolved oxygen. Decapsulated cysts and freshly hatched nauplii of Artemia form an ideal diet for prawns/fish juveniles. Induction of maturity in broodstock prawn can be achieved if they are fed with reproductively active adult Artemia. Thus, demand for Artemia continues to increase with the development and progress of aquaculture. It is readily available in the form of dry cyst containing dormant embryo, which can remain in viable condition for years if stored properly.

The adult Artemia measures about 10mm in total length. However, in some polyploid parthenogenetic strains, it grows upto 20mm in length. Artemia has an elongated body, which can be divided in to head, thorax and abdomen. A pair of antennules, antennae and stalked eyes is present in the head region. Thorax has eleven pairs of appendages known as thoracopods. The abdomen ends in a furca, covered with spines (Fig.). The life span of a brine shrimp is about six months. In bisexual strains, male has penis by which the sperm is transferred into uterus of the female, during copulation. Fertilization is achieved in the uterus. In the case of parthenogenetic strains, embryonic development starts directly as soon as the eggs reach the uterus. The embryos develop in to nauplii or are coated with shell to form cysts, in the uterus, as per the prevailing environmental conditions. The liberated cysts are 200-300 microns in size while the newly hatched nauplii measure 400-500 microns in length.

Taxonomic position

Phylum	:	Arthropoda
Class	:	Crustacea
Subclass	:	Branchiopoda
Order	:	Anostraca
Family	:	Artemidae
Genus	:	Artemia
Species	:	<i>A. salina</i> , <i>A. tunisiana</i> , <i>A. francistoma</i> , <i>A. monica</i> , <i>A. persimilis</i> and <i>A. urmiana</i>

Materials required

Artemia cyst, Scoop net, Sodium Hypochlorite, Sodium thiosulphate, Beaker, Plastic bucket, Sea water, Freshwater, Hatching jar, Aerator, Focussing light, etc.

Hydration of cysts

The required amount of dry cysts are put in a container having sea water or freshwater (20 ml of water for every one gram of cyst), provided with vigorous aeration. In about an

hour, the cysts get hydrated and turn spherical. The hydrated cysts are filtered on 100 µm mesh bolting silk cloth.

Decapsulation of cysts

Decapsulation of hydrated cysts of *Artemia* is achieved by treating them with Sodium hypochlorite (NaOCl) or with commercial bleaching powder, which dissolves/removes the shell.

A. Using Sodium Hypochlorite

The hydrated cysts are kept in 5% of Sodium hypochlorite solution @ 15 ml for every one gram cyst. The Oxidation process takes place and results in rise in temperature beyond 40⁰C. In order to prevent damage of embryo from the raising temperature, keep the cysts in a trough containing cool water/ice cubes and stir the cysts constantly using a glass rod, which facilitates uniform cooling. As the chorion dissolves, a gradual change in the colour of cysts from dark brown to white. In about 5 – 10 mins, the chorion gets completely dissolved and filter the decapsulated cysts on a 100 µm mesh bottling silk cloth. Then, clean the cysts with fresh water or seawater to remove the traces of toxic chlorine. In order to ensure complete removal of residual chlorine, give the decapsulated cysts a dip in to 0.1% sodium thiosulphate solution.

With Bleaching Powder

First dissolve commercial bleaching powder (30% to 33% of active chlorine) to get 200 – 250 ppm of chlorine. The hydrated cysts are filtered into a 100 µm mesh bolting silk cloth and transferred into a bucket filled with water containing chlorine prepared by using commercial bleaching powder. Leave for 15 – 20 mins, until the chorion of cysts get dissolved completely and the colour of cysts turns white. Then remove the bolting silk cloth along with the decapsulated cysts from water. The traces of chlorine are then removed in the same way as stated above.

Hatching of Decapsulated cysts

Decapsulated *Artemia* cysts are hatched in cylindroconical FRP jar of varying capacity (5 – 500 litres) depending on the requirement. The optimum water quality conditions required for hatching of decapsulated *Artemia* cysts are as follows:

Temperature	-	27 – 30 ⁰ C
pH	-	7.5 – 8.5
Salinity	-	25 – 30 ppt
Light	-	1000 lux
Dissolved Oxygen	-	Saturation point

First jars are properly disinfected with 200 ppm chlorine or 100 ppm formalin and then jars are rinsed with the same seawater which is to be used for hatching of decapsulated cysts. Now fill the jar with 25-30ppt of filtered seawater. Arrange for vigorous aeration. Arrange fluorescent light (which helps the dormant embryo to start its metabolic activity) on the top of the hatching jar to get 1000 lux intensity. Cysts will hatch within 12-14 hrs depending on the temperature, light, salinity and strain of *Artemia*. Harvest the freshly hatched nauplii by taking advantage of their phototactic nature.