NTLABS

Technical Information Sheet Number 1

Tips for the Hatching and Rearing of the Brine Shrimp Artemia.

The following tips are intended for those aquarists using the N T Labs BRINE SHRIMP HATCHER KIT. They are formed from the experience of feeding Artemia to fish in our laboratories, from academic research, and from Brine Shrimp culture for fish farming applications.

Tip one:
Brine Shrimp prefer a high pH and Carbonate hardness (KH). For an optimal hatch rate a pH of around 9 and a KH of over 10 dKH is required. They will hatch in water of lower pH and KH, but the hatch rate is occasionally impaired. One way to raise the pH and KH the water for Artemia is to add a minute quantity of Bicarbonate of soda. An easier alternative is to add a few drops of JUST UP, the N T Labs aquarium pH adjuster. Always test the water using NT Labs Test Kits before you add the shrimps to ensure the pH and KH are adequate. The simplest option if a lot of Artemia are being hatched on a regular basis is to make a large vat of water of known pH and KH and decant some into the hatcher for each hatch.

Tip two:
The air supply to the hatcher is essential as this keeps the eggs in the water whilst they hatch. As the eggs have had the capsule removed, they have lost their natural buoyancy. If the eggs were allowed to settle they would clump together and only a few shrimps would hatch. The aeration also adds oxygen to the water, and removes carbon dioxide. If allowed to remain in the water the CO_2 would lower the pH and reduce the survivability of the shrimps.

Tip three:
Light is essential for the Artemia to hatch. A light sensitive enzyme present in the cyst converts a substance called trehalose into glycerol upon the stimulus of light. This sugar is very hygroscopic (it attracts water), so the influx of water through the tough membrane into the egg by osmosis causes it to burst thus releasing the nauplius. The whole hatching process is dependant on the presence of light. Normal aquarium fluorescent tubes tungsten bulbs or even daylight are perfectly adequate for hatching the shrimps. The only limitation is that the light is not too red.

Tip Four:
Feed the hatched shrimps (called nauplii) to your fish after 24 hours hatching. Providing conditions have been ideal for the shrimps to hatch (water chemistry, aeration, light etc), the majority of the nauplii should have hatched. At this stage of their life the shrimps are feeding from their oil reserves, which give them their red-orange colouration, the mouth and anus of the shrimp has not yet formed.

It is due to these oil reserves that newly hatched Artemia, are such a valuable food source for fish. Thus the shrimps should be offered to the fish as early as possible to ensure maximal oil content.

After around a day post-hatching the shrimps will have moulted into the second larval instar, which has a fully formed digestive tract, including functional mouth and anus, and this feeds on bacteria, algae and detritus.

Tip five:
To grow the shrimps on to the centimetre long adult stage is a rather tricky process to do in the home, and will take alot of trial and error to find the right procedure. There are two alternatives available:

Firstly the shrimps can be grown in small vessels such as a drinks bottle. This method can deal with a high stocking density of shrimps, but it involves an almost complete saltwater change every day. One hatch of shrimps can be placed in two 2 litre vessels for example. However as there is a massive build up of waste products like Ammonia and Nitrite, it is essential to change the water the shrimps are being reared in every day. Pour the old water away over a brine shrimp net to prevent loss of the shrimps and add some new freshly made salt water (Follow manufacturers instructions). If you have a marine tank try changing the water for water from your tank as this has a level of bacteria, algae and organic compounds to boost the diet of your growing Artemia. However do not return the old water back into the marine tank as the levels of Ammonia and Nitrite can be very high.

The other alternative is to establish a filtered system that requires far less water changing and general maintenance. The problem with this method is that it is extremely difficult to establish in the home, and requires a much lower stocking density than the previous method. The lower stocking density lowers pollution levels so that a biological filter can process the waste. In this system one hatch would be placed into a large bucket.

Both systems require extremely vigorous water movement by aeration. The best way to do this is to construct an Air-Water-Lift, like those found on an undergravel filter. This circulates the water and prevents stagnation, and also aerates the water adding oxygen and removing carbon dioxide.

Tip Six:
Feeding your shrimps is a matter of trial and error. Use N T Labs BRINE SHRIMP FOOD, which is a unique liquid food prepared especially for growing Brine Shrimp, daphnia, infusoria, and other invertebrate cultures. feed enough food to slightly cloud the water, and as this cloudiness subsides (as the shrimps eat the food), add some more. It is important not to over feed the shrimps, as too much pollution will kill them.

Feed the shrimps around a day post-hatching as, by this time they will have exhausted their oil reserves, and will begin filter feeding. As the shrimps grow they can be fed larger food particles such as aquarium flake food. Again the importance of over feeding cannot be stressed enough.

Tip seven:
Once the shrimps have been growing in the rearing vessel for a number of days, a slime is noticeable on the walls of the vessel. This slime contains algae and bacteria on which the shrimps will graze and add extra nutritional value for the growing Artemia. the formation of this slime layer is promoted by the addition of BRINE SHRIMP FOOD.

Tip eight:
When using adult Artemia as a food source, ensure the shrimps are well fed. Thus they will pass on these nutrients to the fish that eat them. For some fish, such as certain marine butterflyfish, adult Artemia may form a large part of their diet in the aquarium, so it is essential the shrimps contain as much nutritional value as possible.

Adult shrimps can be kept in the fridge, the lower temperature slows down the metabolism of the shrimps, and also lowers the toxicity of their waste Ammonia. About 1 – 2 hours before they are to be fed them to your fish, take out sufficient shrimps and put them in a container with a dense suspension of BRINE SHRIMP FOOD. This will ensure they are packed with nutrients when they are fed to the fish.

Hatching and rearing brine shrimps has been performed for many years in commercial aquaculture situations. However, in the home it is very difficult to replicate. Only through the experience of trial and error will you find a system that is unique for your fish and for your aquarium equipment.

Growing Artemia to feed to fish is not simple, but with patience it is extremely rewarding, in terms of money saved on buying live food and also in increased health and vigour of your fish.

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