

Brine Shrimp (Artemia)

Brine shrimp are found in saline lakes or may be obtained from the Region 20, Living Science Materials Center, as dried resting eggs.

Brine shrimp are sensitive to light and orient themselves so that the ventral surface is placed toward the light. Thus they often swim with ventral region uppermost. In the female, lateral egg pouches are conspicuous. Rapid beating of the limbs is characteristic of this form (150 to 200 beats per minute).

After each molting, the females are ready for mating. Batches of eggs may be produced as often as every 4 or 5 days, when ample food is available. Eggs laid with abundant secretion usually remain dormant for some time, often for several months. A period of drying out seems to shorten the time of hatching. Dried eggs retain their viability for several years, provided they are kept in a cool place. On the other hand, eggs that have a scant secretion when laid, then hatch out in 1 to 2 days as nauplius larvae.

Hatch the brine shrimp eggs by placing them in a solution made up of 30 to 40 gr. of sodium chloride or uniodized salt, in 1 liter of pond water. You may use higher concentrations of salt (up to 6%) and the artemia seem to grow larger. Aeration of the water may promote a better hatch. The eggs should hatch in 1 to 2 days. The larvae will develop more rapidly if they are fed algae; they may be used in the larvae stage as food for small fish and hydra. Larvae will not survive more than five days in the hatching tray unless they are fed.

Salt must not be added to freshwater aquariums, so wash the shrimp larvae before feeding them to hydra or fish.

Hatching Brine Shrimp

Freshly hatched brine shrimp (nauplii) are considered by experts to be the most nutritious first food for baby fish, and consequently, are used exclusively by commercial fish hatcheries in the United States and Canada.

Use 1 gallon of tap water with 7 heaping tablespoons of coarse salt (noniodized) and 1 tablespoon of brine shrimp.

1. Use a jar of appropriate size and add the correct amount of coarse salt and water (80 degrees).
2. Using an air-stone, bubble air into water until salt has dissolved.
3. Add the brine shrimp eggs. Use sufficient air to keep eggs in constant motion.
4. Cover with aquarium light.
5. Eggs hatch in 36 hours at a water temperature of 80° F.; in 48 hours at 70° F.
6. To feed: Remove air-stone. Place a small spotlight on outside of jar. Wait 10 minutes. Live shrimp will collect on side of jar. Eggshells will float to surface.
7. Siphon shrimp into a fine mesh net. Rinse with tap water. Feed shrimp to your fish.

Raising Brine Shrimp to Maturity

Transfer newly hatched brine shrimp into 1-gallon container, such as a small aquarium. Fill up the container with more saline solution of about the same strength as that in the hatching trays.

A good solution for mature brine shrimp is made by adding 5 to 8 gm of sodium chloride to each 100 ml of natural or artificial seawater. To avoid changes in salinity due to evaporation, mark the outside of the container with a wax crayon or masking tape at the original fluid level and add freshwater (not salt solution) every few days up to this mark. It may be necessary to cover the container.

Salt-water algae and bacteria are the natural foods of brine shrimp. Under artificial conditions, the best way to provide food is to add powdered yeast or "quick oats" two or three times a week, to produce a

good general population of bacteria.

Brine Shrimp (cont)

Mix a pinch of yeast or a few oats in a little water, and float a small quantity of this on the surface of the culture. Too much yeast or oats will kill the brine shrimp. A general rule is to feed no more than disappears in two days leaving the water crystal clear. Oxygen is also essential for successful maturation of brine shrimp, so artificial aeration is desirable.

Subculture, once a month, by straining off the brine shrimp in a net, discarding the old solution, and adding new salt water. Mature brine shrimp will die unless the salinity remains approximately the same at each water change. Small amounts of chlorine contained in tap water can also be harmful, so use aged tap water or spring or pond water in making up the new solution. Prevent crowding. Return only half the brine shrimp to the original container. Either discard the other half or culture them in a similar container.

Experiments With Brine Shrimp

Some recommended experiments using brine shrimp cultures:

1. Compare the hatching rates of cultures kept in a constant temperature oven, in a vegetable bin or crisper of a refrigerator and at room temperature.
2. Can brine shrimp eggs survive freezing and thawing?
3. Prove the aeration gives better results in hatching and population growth?
4. What are the effects of crowding on hatching and population growth?
5. Show by experimentation why iodized salt should not be used for the culture medium. How does salt concentration affect hatching?
6. Is it possible to induce brine shrimp to adapt to fresh water? Demonstrate the range of salt concentration necessary for the survival of newly hatched and mature brine shrimp.
7. What is the approximate life span of brine shrimp? Assess this by determining when the population is greatest in a hatching tray.
8. What is the influence of salt concentration on the morphology of brine shrimp?