How to use brine shrimps correctly to activate ranchus

From Kinjo-kai bulletin, No. 46, 2001

1. Introduction

There are about 300 spots for a habitat of brine shrimps in the world. Each spot varies from the others. Owing to the reason that they can stand a high concentration of salt, brine shrimps crowd in a salt lake possible to avoid being eaten by other aquatics. However, only a few spots commercially produce brine shrimps on a large-scale. The Great Salt Lake of Utah in the United States, Qing Hai of China, and the Caspian Sea of Russia are famous among them.

2. How to produce brine shrimp eggs

The production process of the Great Salt Lake, where the quality and supply are most stable, is described below.

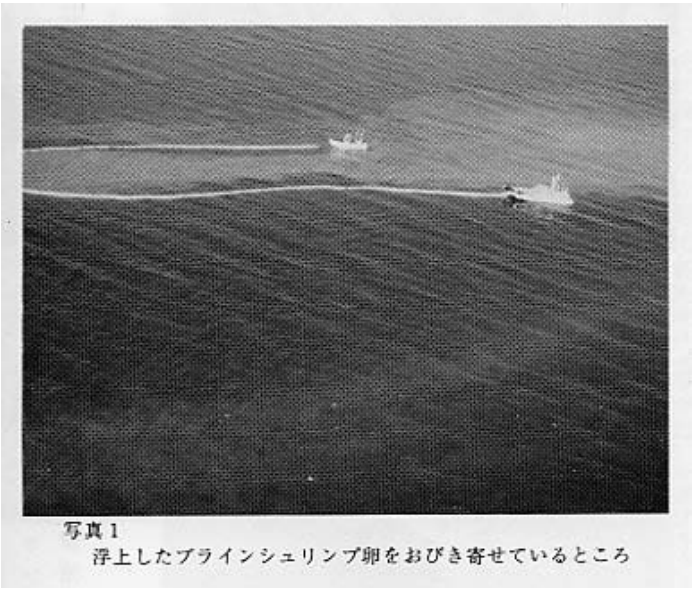

写真1
浮上したブラインシュリンプ卵をおびき寄せているところ

Photo.1

写真2
おびき寄せたブラインシュリンプ卵を採集しているところ

Photo.2

In general, there are following two ways to catch brine shrimps in a salt lake:

1) The way to catch the eggs washed up on the shore of a lake.
2) The way to catch the eggs floated on the surface of a lake.

The eggs produced in the previous years and miscellaneous germs are also caught in 1). Therefore, the safest way of high quality is 2) as shown in the photos 1 and 2.

3. The process to catch brine shrimps

The process to catch brine shrimps in the Great Salt Lake is as follows:

Catching – They observe the Lake through the air by Cessna looking for a belt of floating brine shrimp eggs.

When found a belt, they contact a boat on the Lake by wireless, and the boat rushes to the spot.

They enclose the egg belt by an oil fence from the boat, collect the eggs gradually narrowing the range, and pump them up.

Washing – They wash the eggs in salt water.

Maturing – They mature the eggs keeping in cold storage.

Processing – They process the eggs by washing, sterilising, drying, and controlling the quality.

Packing – They pack the eggs into an aluminium bag and a tin.

4. Hatching rate and how to caluclate

Ranchu enthusiasts tend to think the price first and most when buying brine shrimp eggs. However, I believe the eggs of the highest hatching rate are the best and usually have such ones. Here is a summary of how to calculate a hatching rate.

Put artificial seawater, or a 2.5% salt solution, into a beaker. Measure precisely 1g of the eggs and put them into the beaker. Take a sampling with a pipette while pumping air and count the number of the eggs by a stereoscope. Apply about 2000–lux of light to the beaker for 24 hours keeping the water temperature between 25 to 28 degrees to hatch the eggs.

After 24 hours, take again a sampling with a pipette and count the number of the hatched larvae. Divide the number of the hatched larvae by the number of the eggs. The obtained percentage is a hatching rate. For instance, the latest hatching rate is 92%, with 270,000 eggs/g and 250,000 hatched larvae/g.

In conclusion, a good or bad hatching rate is an important factor for selecting brine shrimps.

5. Hatching and separation of brine shrimps

In the case of the brine shrimps supplied by a manufacturer I use, I put 2.4kg of regular salt into 100 litres of water (80% of 3% salt concentration contained in regular seawater). Then I set a 30-watt circular fluorescent light, add 100g of the eggs, and begin to pump air. After checking the regular salt dissolved, I irradiate the above fluorescent light. The point to irradiate is for six hours after added the eggs. Hatching ends in 24 hours, so I separate the eggs immediately.

Baby ranchus eat egg shells that attached to the hatched larvae. But those shells are not digested. This is inefficient and makes a pond cloudy. Therefore, it is necessary to select the eggs that clearly separate from each other.

6. The ingredient of nutrition of brine shrimps

The ingredient of nutrition of brine shrimps (general composition) is 45% of protein, 22% of fat, 11% of carbohydrate, and 10% of ash. The composition of fatty acid in fat is as follows:

16 ... 0	12.3%
16 ... 1	7.8%
18 ... 0	3.8%
18 ... 1	38.2%
18 ... 2n-6	5.3%
18 ... 3n-3	20.1%
20 ... 4n-6	3.3%
20 ... 5n-3	1.3%

Highly non-saturated fatty acid, such as EPA (20 ... 5n-3) and DHA (22 ... 6n-3), necessary for fish to grow and activate is less contained as in the above. Therefore, it is necessary to give such as algae, which contain fatty acid, to strengthen the nutrition.

7. Secondary culture and strengthening of nutrition of brine shrimps

A brine shrimp hatches in 24 hours. However, it is not possible to eat feed in the first 8 hours because its mouth is kept shut. It is just the same as a baby ranchu does not swim until it eats up all egg sacs after hatched.

For the purpose of strengthening baby ranchus physically, I dissolved dehydrated powder of marine chlorella in water (using such as a juicer) and gave it to the larvae of brine shrimps

eight hours later after hatched. It depends on the quantity, but a tank for culture turned from green to translucent in a few hours. Abdomens of the brine shrimps became green because of chlorella. When gave them to baby ranchus, a disease rate decreased by more than 30% compared to the year when gave nothing.

In the current ranchu world, it seems the time simply giving brine shrimps immediately after hatched to baby ranchus have passed thinking of a disease due to bacteria or a sudden death due to a virus.

About algae for secondary culture, the above one manufactured by Nissin Marinetech, and a DHA-enriched marine feed for strengthening the nutrition by Harima Chemicals are sold on the market.

8. Notes on preserving brine shrimps

Ranchu enthusiasts buy brine shrimps considering the amount to use annually to some extent. However, a hatching rate rapidly decreases if the temperature changes in preservation regardless of how packed them, in a vacuum pack made by an aluminium bag, or in a tin. Therefore, it is essential to keep them in cold storage, but NOT freezing.

9. Lifetime of brine shrimps in fresh water

The initial feed inhabiting in fresh water, such as water fleas, does not die until ranchus eat them up. However, even the larvae hatched from brine shrimp eggs of good quality hardly live more than three hours because brine shrimps inhabit in seawater.

I make pond water into a 0.02% salt solution beforehand. Or, after separated, I take both brine shrimps and water used for hatching into a cup. When gave them to my brine shrimps, their life time became longer, about five hours. So, why don't you try?

10. The prospects for brine shrimps as a live food

Various ways will be considered in the direction of giving substances to brine shrimps of good quality to heighten energy, speed the growth, and stop diseases of ranchus, and of strengthening their nutrition. For instance, an efficient way to strengthen the nutrition is give immunogens and antioxidants, concretely DPA, β carotene, tocopherol, vitamin C, amino acid, and so on. The balance of these ingredients with brine shrimps is the point. Therefore, we should not buy brine shrimps just because the eggs are inexpensive or expensive. It is not too much to say that selecting manufacturers that provide the eggs of good quality as well as related technologies as in the above hold the key to improve how to keep ranchus in future.