

Hybrid and biological feature of *Artemia*

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Introduction

Artemia and its cyst are applied broadly as fresh bait of high quality in aquaculture industry. At present the strains of breed aquatics and application of *Artemia* are almost the nature strains. Many investigations indicated that different strain of *Artemia* has different biological feature and nutrition composition. They produce difference for the growth development and reproduction of feeding animal. Nauplius size and the content of fatty acid of long chain high unsaturation are even interrelated whether the raising seeding is success.

There are many differences between the different strains of *Artemia*. Recently many aquaculture people of the world added the nutriment into the culture water of *Artemia* in order to improve its quality [2]. But it is not a fundamentality route of improving its nutriment in genetics. For increasing its bait value and satisfying the need of aquaculture industry better, it will be an effective route that we developed the study on screening and improving quality of the strains. In this paper we gained 4 hybrid strains. Two of them were compared their characteristics of biology and bio-chemistry. We hope that these results will provide theory evidence for resource exploitation of *Artemia*.

Materials and Methods

The strains of *Artemia* used in this study were 4 parthenogenesis strains (north strain (TP), Xingjiang Balinkun saline strain(XP), Neimeng Maqianqi strain(NP), Qinghai Gahai strain(QP)) and 2 bisexual strains(Shanxi Yuncheng(SB) and callifornia salina(AB)).They were hatched, cultured by the book method in the lab. A vary of plankton algae were used as their baits

1.1 Hybrid of *Artemia*: The rare male was sought out from parthenogenesis strain and partnership with the female (egg purse coming on hardly) of bisexual strains separately (see table 1). Every pair was cultured in a beaker of 100 ml filter sea water of 42‰. They were fed with microalgae. After reproduction, the cyst of every hybrid strain was collected and kept in the saturation sea water at 4℃.

1.2 Measure of cyst diameter (CD): After dryness at the room temperature, the cysts were measured diameter in the microscope. 100 cysts were test for every strain. Average diameter and square difference of cysts were calculated.

1.3 Determination of the reproductive capacity (RC) and the rate of oviparous individual (RO): 15 pairs of adult individuals from hybrid strain and

their parents were cultured in the beaker of 100 ml filter sea water (42‰) separately. After reproduction, it was taken count of the number of offspring. Then the RO (the number of oviparous individual / the number of total individual) was calculated.

1.4 Determination of the rate of hatch (RH): After it was 2 month that the cysts were kept in the saturation sea water, the cysts were dipped in the distal water, 30 mins at the room temperature. 100 cysts of every strain were hatched by the book method, it was repeated one time. Then the RH was calculated as following: the number of hatched individual / the number of total individual.

1.5 Measure of the content of protein: After starvation 24h, the adult of TP×SB and SB were washed by distal water, dried in the dryer. The soluble protein (SP) was tested by the Folin-hydroxybenaene method. The total content of protein (TP) was tested by the Kjeldahl method.

1.6 Analyze of the electrophoresis: After starvation 24h, 4 adult of TP, TP×SB, XP×SB, SB were washed by distal water separately. Samples preparation and electrophoresis method see the reference literature [3 ,4, 5].

The total of the band and the number of the same band in every path were counted by the electrophoresis pattern. The comparability I of the pattern was calculated as following: $I = 2 I_{xy} / I_x + I_y$. I_x and I_y denoted the band number of x and y separately. I_{xy} denoted the same band number between x and y. I denoted the resemble coefficient of the band of x and y.

Further the heredity distance was calculated as following: $D = - \ln I$

Results and Discussion

Four of hybrid strains of *Artemia* were gained with crossing technique. The biological feature and nutritive composition of the two of them were analyzed. The results showed: reproductive capacity and the rate of oviparous individual of hybrid strains were higher than their parents. The diameters of cyst of hybrid strains were smaller than their parents. The rate of hatch of hybrid strains was lower than their parents. The contents of protein of TP ×SB were higher than its parents, while one of XP×SB was lower than its parents. The contents of C18 : 2 and EPA were higher. By the electrophoresis of isozyme (and protein), the analysis of genetic distance showed that XP×SB is a new strain, but the other hybrid strain (TP×SB)is not a new strain.

References

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