

Analysis on Breeding Techniques of *Cherax Quadricarinatus*

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Keywords: Australia; freshwater crayfish; breeding technique

Abstract: In this paper, the breeding technique of *Cherax quadricarinatus* is briefly discussed. The selection of the early broodstock and the parental pool of *Cherax quadricarinatus* are used as the starting point, and the preparatory work is proposed. Then the operation and daily management of the wintering shed are elaborated, and the *Cherax quadricarinatus* mating is proposed. Oviposition management and daily management measures of prawn shrimp, and the management strategy of juvenile shrimp, standard rough pond and shrimp seedlings are finally proposed, aiming to promote the smooth breeding of *Cherax quadricarinatus* through technical optimization, only for reference.

1. Introduction

Cherax quadricarinatus belongs to the crustacean family. It is large and adaptable. It has a fast growth rate, wide appetite and fresh taste. As a kind of shrimp with higher edible rate, *Cherax quadricarinatus* is more economical. In the breeding process of *Cherax quadricarinatus*, the survival temperature and suitable growth environment should be clarified. Under normal circumstances, when the growth environment temperature is not lower than 13 °C and not higher than 28 °C, it is most suitable for the growth of *Cherax quadricarinatus*, once the water temperature exceeds 30 °C will inhibit its growth. In order to promote the normal breeding of *Cherax quadricarinatus*, it was decided to transfer it to the cement pool greenhouse and cultivate it through winter temperature control.

2. Pre-work of *Cherax Quadricarinatus* Breeding

Before the formal breeding of *Cherax quadricarinatus*, it is necessary to do a preliminary preparation and scientifically select the broodstock to ensure the fertility of the shrimp species. Under normal circumstances, the vigorous and disease-free shrimp is used as a broodstock to ensure that the appendage is intact and the body is smooth, there is no attachment, the shrimp body is preferably above 9cm, and the maturity and egg laying ability are excellent. Large prawn to ensure that the broodstock has good fertility. After reasonable selection of broodstock, the broodstock can be grouped according to specific specifications, and the male shrimps are selected to lay a good foundation for the smooth development of *Cherax quadricarinatus*.

In order to accurately identify female shrimps and males, it is necessary to carefully observe the appearance of adult shrimps. Under normal circumstances, male shrimps of the same age are obviously larger, and soft membranous plaques are visible on the outer side of the front end of the males. In red. In order to promote the breeding of *Cherax quadricarinatus*, the specific proportion of female and male shrimp should be mastered under natural breeding conditions, generally similar to the proportion of *Macrobrachium rosenbergii* culture, slightly increase the proportion of male shrimp, the actual breeding process of female and male shrimp The optimal ratio is 2:1.

After scientific selection of broodstock, it is necessary to fully grasp the basic situation of the cement pool, regulate the fishing of the broodstock into the pond, and control the specific density and pooling time of the broodstock to promote the normal breeding of *Cherax quadricarinatus*. Specifically, the specifications of the cement pool are generally 5m×10m×1.5m, and the cement pools are sequentially numbered. The 30cm long PVC pipe is placed at the bottom of the cement pool, and the air is humidified by a blower. Covered to avoid direct sunlight and affect the breeding of broodstock. After fishing the broodstock in the outer pond, the female shrimp and the male

shrimp are distributed to the foam box, transported to the greenhouse, and the amount of VC is adjusted and the temperature difference is adjusted to allow the broodstock to enter the pool. The amount of broodstock stocked in the wintering pond is different, and it has a certain relationship with the actual catch. For the harvested shrimp, it needs to be separately maintained according to gender.

3. Operation and Daily Management after Entering the Winter Shed

For the shrimp species that enter the wintering shed, it is necessary to strengthen the operation management from the two aspects of temperature and water quality. After the shrimps enter the greenhouse, the temperature of the greenhouse is adjusted in time with the state of the shrimps, and it is kept at about 24 °C. During the process of gradually heating up, the shrimps are basically kept in normal feeding. It is found that the low temperature tolerance of the males is obviously excellent. For females. In the process of water quality management, untreated fish pond water is used as aquaculture water. The cement pond contains a small amount of water peanuts, but the water peanut leaves are easy to fall and the water peanuts rot will affect the water quality of the cement pool. After entering the wintering shed, the aquaculture water should be replaced regularly. In order to promote the breeding of the shrimp, it is decided to use groundwater to reduce the loss of the shrimp.

First, reasonable control of water temperature. After the shrimp enters the wintering pond, the temperature of the pond water should be accurately recorded. If the temperature is lowered, the boiler can be heated to ensure the temperature of the pond water is 22 °C to promote the growth of the shrimp. At the same time of controlling the water temperature, it is necessary to pay oxygen to the pool to ensure that the dissolved oxygen in the pool is not less than 5 mg/L.

Second, adjust the water quality. In the daily management process, it is necessary to control the pH value of the shrimp pond water to promote the growth of the shrimp, avoid the change of the shrimp clam shell time or increase the mortality of the clam shell. Generally, the pH value of the shrimp pond water is controlled between 8.0 and 8.2. During the winter, the lime is regularly splashed to ensure the pH value is stable. Generally, the lime is splashed at 7d. The ammonia nitrogen content in the shrimp pond water should be less than 0.2ppm, the nitrite should be less than 0.05ppm, and the dissolved oxygen should be above 5mg/L. If necessary, the water quality can be improved by biological water transfer agent.

Third, feeding. In the breeding process of *Cherax quadricarinatus*, in order to ensure balanced nutrition, animal feed or plant bait should be properly fed in daily feeding, and the feeding ratio and specific time should be controlled. It can be fed according to the weight of 4.5% of the broodstock. The best feeding time is 2h.

4. *Cherax Quadricarinatus* Mating Spawning and Daily Management of Prawn

After the end of winter, the hydrology can be appropriately raised and kept at 24 °C to promote the mother shrimp to hug. The female shrimps that hold the eggs often enter the PVC tube. After observing the color of the eggs, the eggs with similar colors are transferred into the incubator, and each of the three eggs can hold the eggs. Mother shrimp and male shrimp that have not been bred continue to be kept, and the ratio of female to male is adjusted. It can also be placed in an incubator for storage. Regular inspection of the mother shrimp eggs, usually 10d as an inspection cycle, to confirm that the male shrimp can be removed after the eggs are removed.

The minimum number of eggs laid by red crayfish is 200/tail, up to 800/tail, and the actual egg production has a certain relationship with the size of the individual shrimp. Female shrimp in the northern tropical regions of Australia can lay eggs 3-5 times a year, but under natural breeding conditions, the performance of the female shrimp may be affected, and the female shrimp can lay eggs about twice a year.

There is a certain relationship between actual hatching and water temperature conditions. Under the condition of water temperature of 29 °C, the hatching of female shrimp takes 31 days. Under the

condition of water temperature of 24 °C, the hatching of female shrimp takes about 45 days. If the water temperature is controlled to 26 °C, the hatching of female shrimp takes about 42 days. Properly raising the water temperature can promote hatching, but it should not make the water temperature too high, otherwise it will accelerate the deterioration of water quality.

The amount of activity of the female shrimp after the egg is held is small, which in turn leads to a decrease in the food intake of the female shrimp. If the female shrimp is in the incubator, 5-10g of small fish can be fed at night to meet the nutritional needs of a single female shrimp. Check the incubator the next day and take out the remaining fish in time to avoid affecting the water quality of the hatchery. In order to improve the management quality of the prawn, it is necessary to strengthen the water quality management. The incubator uses circulating water, and confirms that the water quality index is reached, and the new water is replaced in time. The mother shrimp hatch for a long time, and the bottom of the incubator is very easy to accumulate. Therefore, it should be cleaned regularly to ensure that the water quality meets the hatching needs of the female shrimp.

5. Juvenile Shrimp, Standard Rough Pond and Shrimp Management

During the management of juvenile shrimp, it is necessary to regularly observe whether there is shrimp seedlings leaving the mother in the incubator, take the water outlet as the outlet, release the shrimp seedlings with the water flow, and transfer them to the juvenile shrimp breeding trough to carry out the standard cultivation. The cultivation period is 25d, after the shrimp body length is 2.4cm or more and does not exceed 3cm, it can be cultured and produced. It should be noted that the shrimps leaving the mother body should not be directly placed in the outer pond for breeding, otherwise the survival rate of the shrimps cannot be guaranteed.

The juvenile shrimp standard pool is a cement pool with a volume of 50 m², and the water depth within it should not be less than 30 cm and should not exceed 50 cm. The hatching cylinder has a diameter of 1.9 m and a water depth of 30 cm. Before putting the shrimp seedlings, it should be disinfected with potassium permanganate. After soaking for about 4 hours, drain the water, configure the air pump, boiler heating device, etc., raise the seedlings with well water, and increase the oxygen appropriately to promote the survival of the young shrimps. . In combination with the growth habit of prawn, a shade net can be set and hidden objects can be prevented at the bottom of the pool to meet the demand for low light of the prawn. In addition, the mesh can be placed in the pool and exposed to the surface to promote the habitat of the prawn.

In the breeding process of *Cherax quadricarinatus*, it is necessary to scientifically set the standard control group for density comparison, temperature comparison and bait comparison. In the density comparison process, the shrimps with different densities are respectively put into the glass cylinders with the same diameter, so that the water temperature is not lower than 24 ° C, and does not exceed 26 ° C. Under the aquaculture conditions, the feed is fed with the open material, and the measurement is carried out periodically. The size of the shrimp is generally measured at 10d intervals and the number of shrimps is estimated. After 30 days of culture, the shrimp seedlings grow from the incubation length of 0.8cm/tail to 2cm/tail, and the actual survival rate is not less than 60%. After that, the shrimp density should be appropriately reduced to meet the activity requirements of the shrimp growth process and avoid growth. Insufficient space causes the shrimps to cross each other.

In the process of nursery, the temperature of the pool should be adjusted. Generally, it should not be lower than 19 °C, and should not exceed 22 °C. The specifications of the shrimp should be measured regularly, and the number of shrimps should be estimated. In order to avoid the survival rate and growth rate of shrimps, it is necessary to control. Good shrimp culture temperature, generally requires temperature above 22 ° C, if conditions permit, the temperature can be properly raised to above 25 ° C, but not exceed 28 ° C, so as not to accelerate the deterioration of water quality.

During the nursery process, the comparison of the bait is mainly carried out in a standard diameter glass cylinder, and the feeding of the shrimp, the feed, the egg of the worm, and the like are carried out. The original number of shrimp in the glass cylinder is 600. The method of

micro-flow aquaculture is adopted. The test conditions are close to the density test. The test temperature is not lower than 24 °C, and the temperature is not exceeded 26 °C. The specifications of the shrimp are regularly measured, and the measurement interval is 5d. And estimate the number of shrimps, with a test period of 20d. It can be seen from the experiment that the survival rate of shrimp seedlings is less affected by the type of bait. In the previous experiment, the shrimp size was small, the activity ability was effective, and the feeding ability was weak. There was a special requirement for the grain size of the bait. The best bait was matched with the shrimp. Feed or harvest eggs, can feed a small amount of fish gills. With the growth of the shrimps, the length of the shrimps reached 1.5cm/tail, that is, after 20d of the test, the shrimps in the glass jars were no longer fed with the opening materials and the eggs, but the north and south white prawn materials and the minced fish were replaced. The size of the two is relatively large. At this time, the facility capacity of the shrimp seedlings is enhanced and the activities are relatively frequent. In the feeding process, plant-based bait, such as vegetables, melons, and corn, can be appropriately added, and the smashed and put into it. In order to meet the nutritional needs of shrimp growth, the breeding effect of *Cherax quadricarinatus* is actually improved.

In the management of shrimp seedlings, water quality monitoring should be done, usually every 3 days, in order to fully grasp the water quality status, and if necessary, use sodium humate to regulate ammonia nitrogen and nitrite in water, and control it within the standard range. Inside. The daily management of shrimp seedlings must pay attention to the splashing of calcium supplement products and live bacteria water-control agents, generally in 5d intervals. In the feeding of bait, it is necessary to observe the actual feeding situation of the shrimp seedlings on the material table, so as to reasonably control the specific feeding amount of the bait. During the daily management of shrimp seedlings, the amount of feed is directly related to the amount of fouling at the bottom of the cement pond. Under normal circumstances, when there is less feed, the bottom of the cement pond is less polluted. With the growth of the shrimp seedlings, when each shrimp seedling reaches 1.5cm, the sediment can be found at the bottom of the cement pond. At this time, it is necessary to carry out the sewage treatment to avoid the water quality being affected.

6. Conclusion

According to the above analysis, in order to comprehensively improve the breeding quality of *Cherax quadricarinatus*, it is necessary to master the correct breeding technology, optimize management methods, ensure proper breeding temperature, and strengthen water quality management to meet the nutritional needs of *Cherax quadricarinatus*. Separation provides a dark and quiet breeding environment for females to increase the survival rate of juveniles. During the breeding process of *Cherax quadricarinatus*, it is necessary to carefully observe and record, and adjust the management method at the first time to find the problem to promote the smooth breeding of *Cherax quadricarinatus*.

Acknowledgment

This work is supported by Jiangsu Agri-animal Husbandry Vocational College (No. NSF20161301), It is also supported by Jiagnsu fishery science and new technology projects (No.Y2017-41).

References

- [1] Tao Zhonghu, Zhou Wei, Zhou Duoyong, Wang Shujuan, Shu Nana, Fang Wei. The practice and exploration of crayfish ecological breeding [J]. China Fisheries, 2015(12):73-75.
- [2] Dong Jiancheng, Wang Fang, Zhang Lei. Seed Breeding Techniques of Freshwater Crayfish [J]. Friends of Farmers' Riches, 2013(20):135.
- [3] Li Zhimin, Liu Xijun, Cao Guijuan, Liang Jiuzheng. Feasibility analysis of *Cherax*

quadricarinatus culture in Weinan County [J]. Hebei Fisheries, 2012(11):41-43.

[4] Tang Yuhua, Huang Yunfang. Breeding and efficient breeding technology of pond crayfish seedlings [J]. Agriculture & Feed, 2012(09):59-61.