



Culture Technology of Chinese Sucker (*Myxocyprinusasiaticus*)

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Abstract: *The Myxocyprinusasiaticus is a rare and precious fish in the Yangtze River in China. It is listed as the second-class endangered rare animal in China. In order to reasonably develop the resources of Chinese Myxocyprinusasiaticus and explore the ways of artificial cultivation, which are conducive to the protection of resources and sustainable development, this paper mainly introduces the conditions of ponds, cultivation mode, feeding management, disease prevention and control, and puts forward the selection of appropriate models, the development of appropriate formula feed, the optimization of pond design, and the control of water quality to ensure artificial cultivation.*

Keywords: *Chinese Myxocyprinusasiaticus; Cultivation; Technology*

1. INTRODUCTION

Chinese *Myxocyprinusasiaticus* is one of the most important economic fish in the upper reaches of the Yangtze River in China. It has not only edible value, but also great ornamental value. From March to April each year, the *Myxocyprinusasiaticus* lay eggs and propagate under the rapids of Jinsha River, Zhijiang and Jialing River. Juveniles go downstream along the Yangtze River, part into streams, part into lakes, and their maximum body weight is about 35 kg. Because of the environmental damage caused by water conservancy projects and so on, the *Myxocyprinusasiaticus* cannot propagate in the upper reaches, resulting in a significant reduction in resources. Therefore, it is listed as the second-class protected animal in China [1-2]. Therefore, the market gap of artificial cultivation of *Myxocyprinusasiaticus* is large, and the cultivation of fry and adult fish culture technology need to be further improved.

2. MATERIALS AND METHODS

2.1. Pond Conditions

The pond area used for fry culture is 1500-3000 square meters, which is easy to manage. The pond is orientated from east to west, which can prolong the illumination time. The bottom of the pond is loam or gravel. The height of the pond is 2 meters and the highest water level is 1.6-1.8 meters. It is convenient to drain and irrigate. At the bottom, a micro-porous aeration pipeline was laid, about 20 cm away from the bottom[3]. Around the pond, about a tenth of the pond area is reserved for the construction of cement ponds, and aeration pipes are laid at the bottom of the cement pool. In the cement pool, the substrates are made of materials like volcanic rocks, coal cinder and ceramsite, and aquatic economic crops are planted to simulate artificial wetlands. Pump the water from the bottom of the culture pond to the treatment pond, and the microorganisms attach to the substrate to decompose organic matter, and then absorb excessive nutrients through aquatic cash crops to achieve the purpose of purifying the water, and then the treated water flows into the pond, so it has a complete water intake and outflow system.

2.2. Water Quality Conditions

The water source for aquaculture is Yangtze River water, and the water source is abundant. The pH is 7.2-8.5 and the dissolved oxygen is more than 6mg/L. At each pond, there is an independent storage and drainage system to prevent the spread of disease. The evaluation criteria adopted for water environment investigation in crab ecological aquaculture area are Class III criteria of Fishery Water Quality Standard (GB 11607-89)[4] and Surface Water Environment Quality Standard (GB 3838-2002)[5], and the pH

is 6.5-8.5, dissolved oxygen ≥ 5 . The requirement is that the water source is adequate and easy to draw and drain.

2.3. Fingerling Stocking

12 to 15 days before stocking, dry the pond and disinfect it, and the bottom silt was controlled to be about 20-30cm. Sprinkle 0.15-0.22kg of quicklime evenly per square meter, and then expose for 5 days to kill pathogens. After water filling, along the edge of the pool, transplant 1.5 to 2.0 meters of aquatic grasses, such as water peanuts, for Chinese *Myxocyprinusasiaticus* to escape, prey, inhabit shelter and regulate water quality.

Choose *Myxocyprinusasiaticus* species with strong physique, bright body color, free movement and more sensitive response to external stimuli. The size of fish species is uniform, about 10 centimeters, and 2,000 fish are kept every 666 square meters. Before the fish are put into the pond, we need to soak them in 3% salt water for 5 to 10 minutes. Each 666 square meter is matched with 160-200 silver carp of 200 grams, and 40-50 variegated carp.

2.4. Water Quality Management

Because the aquaculture water body of *Myxocyprinusasiaticus* is small and its stocking density is high, there are many residual baits and excreta of *Myxocyprinusasiaticus*, which can easily pollute the water quality, affect the growth of *Myxocyprinusasiaticus* or induce fish diseases. Therefore, we need to constantly adjust water quality and water level. In the initial stage, we control the water level from 0.4 to 0.5 m, and then gradually add water [6]. In April-May, the water level remains at 0.6-0.8 M. In the high temperature season, we should control the water level of 1.3-1.5 meters and remember to add fresh water. And we need to turn on the aerator regularly, keeping the water transparency between 25 and 30 centimeters. Water temperature, dissolved oxygen, nitrite, hydrogen sulfide, ammonia nitrogen and pH are measured regularly. Regularly use substrate improvers, such as calcium peroxide, zeolite, etc. Every half month to one month, light, biological active agents such as bacteria, EM bacterial solution and compound bacillus are put into the water to regulate the water quality and maintain the benign circulation of the water body. During the whole breeding period, the pond pH is between 7-8.5, $\text{NH}_3\text{-N} < 0.02 \text{ mg/L}$, $\text{NO}_2\text{-N} < 0.1 \text{ mg/L}$, sulfide $< 0.2 \text{ mg/L}$ and dissolved oxygen is more than 5 mg/L. As for water quality inspection, please refer to the Water and Wastewater Monitoring and Analysis Method (Fourth Edition).

2.5. Bait Feeding and Routine Management

Myxocyprinusasiaticus have small mouth diameter and high requirement for protein content in food. We choose the formula feed with diameter of 2 mm and protein content of more than 38% [7], and add water, earthworm pulp, fish surimi and mussel surimi as food attractants. We should pay attention to the freshness of the food, avoid putrefaction and deterioration of the food. Fix the time and place of feeding, control the feeding amount according to the 4 to 8% of the bodyweight, and make corresponding adjustments according to season, weather and the intake and activity of Chinese *Myxocyprinusasiaticus*. Check the eating table; if there is a small amount of residual bait on it, it is OK. Ensure that the Chinese *Myxocyprinusasiaticus* is well fed. Feeding time is from 9 a.m. to 10 a.m. and from 16 to 17 p.m. Choose the appropriate size of bait according to different growth stages [8].

We should insist on the inspection of ponds in the morning and evening to observe the growth, feeding, activity of *Myxocyprinusasiaticus* and the changes of water quality. Check the water inlet and outlet to prevent fish from escaping and enemy invasion. Find out the abnormal situation, find out the reason in time and take corresponding measures to solve it in time and make good production records.

2.6. Disease Control

In order to effectively prevent fish diseases, we should adopt the principles of prevention as the main, prevention and treatment should be combined and prevention is more important than treatment [9]. Specific practices are as follows: selection of high-quality fish species with strong physique and regular specifications; feed fresh, comprehensive-nutrition baits in line with the dietary habits of *Myxocyprinusasiaticus*; stocking density should be scientific and reasonable, and easy to manage;

strengthen the water quality management, careful management and prevention of fish damage, and adhere to the ecological prevention and control. Before and after stocking, medicated baths and disinfection are carried out with drugs such as potassium permanganate or salt. In the growing season, every 15 days or so, quicklime should be applied once, and 75-150 kg/hm² each time. It can not only disinfect and prevent diseases, but also improve water quality, adjust pH value and increase calcium ion content. Real-time addition of micro-ecological agents can regulate water quality. In the process of aquaculture, the water body and feeding table need to be disinfected regularly. Appropriate cultivation, scientific feeding, drug prophylaxis and comprehensive measures should be taken to reduce the chance of disease infection and disease incidence.

3. DISCUSSION

3.1. Intercropping Model

The *Myxocyprinusasiaticus*, as an omnivorous fish species, mainly feed on benthic invertebrates, plant debris and organic matter in the mud. It has a nature of nature in the fry stage. It has a sweet temper and does not compete for food. It lives in the middle and lower layers of the water body. It has a strong habit of avoiding light, and does not have obvious or regular diurnal feeding or activity rhythm. It has the characteristics of congenital evolutionary corresponding to higher water velocity, and its strong swimming ability is related to its survival in torrents. Although *Myxocyprinusasiaticus* has strong swimming ability, its competitiveness in feeding commodity feed is not as good as carp, crucian or other species under the condition of artificial cultivation [10]. Wang Guiliang (2018). The polyculture mode of *Myxocyprinusasiaticus*, *Pelteobagrusfulvidraco* and *Leiocassislongirostris* has better benefits. He found that *Myxocyprinusasiaticus* are highly clustered, especially in the juvenile stage. Once they get sick, it will be highly infectious. The intercropping of peculiar fishes such as *Pelteobagrusfulvidraco* and *Leiocassislongirostris* in the main aquaculture pond of *Myxocyprinusasiaticus* can enrich the species of pond culture, avoid the risk of large number of deaths in the event of disease or in the event of irresistible natural disasters to a certain extent, and at the same time reduce the loss of farming benefits caused by fluctuations in market prices of a certain species, and improve the stability of the comprehensive benefits of pond culture. In this experiment, *Myxocyprinusasiaticus* is the main culture. At the same time, a small amount fish whose habitat and feeding habits are different from *Myxocyprinusasiaticus*, such as *Hypophthalmichthys molitrix* and *Aristichthys nobilis*, are put in the pond so as to make full use of the space resources of different aquatic layers and help to regulate water quality, improving the natural purification ability of fish ponds and achieving stable production and high yield. Considering the high protein content of *Myxocyprinusasiaticus*, we should choose a variety with similar diet and higher value for polyculture.

3.2. Large Size *Myxocyprinusasiaticus* Species Can Shorten the Cultivation Cycle

Ma Jingang (2010) carried out intercropping of 15cm *Myxocyprinusasiaticus* species in adult fish pond, and the density of the fish was 750-825/hm². After 240 days of growth, the average survival rate was 89.05%, the commodity rate was 100%, and the average yield per unit area reached 697.5 kg/hm². The average survival rate of intercropping of 3.3-5cm *Myxocyprinusasiaticus* was 79% and the commodity rate was 89% [11]. In the experiment of Chen Xiaojiang (2013), the size of *Myxocyprinusasiaticus* was 10cm. The average survival rate was 91.2% and the commodity rate was 100% after 250 days of cultivation. The fish density of pond 2 and pond 3 were 750/hm² and 900/hm² respectively. The yield of *Myxocyprinusasiaticus* was 342 kg/hm² and 405.75 kg/hm² respectively [12]. Species size was one of the main influencing factors.

3.3. Build a Good Ecological Environment to Prevent Diseases

During the whole experiment period, no large-scale disease should be found, the prevention works mainly relied on is done well and a good aquaculture ecological environment is created. Before releasing fry, we should thoroughly disinfect ponds; formulate reasonable stocking density; regularly apply microecological agents to regulate water; regularly open microporous aerator to maintain sufficient dissolved oxygen in water; manage and control the growth of aquatic plants; add vitamin C, immune

polysaccharides to bait during the disease-susceptible season (June-October) to prevent the occurrence of disease by enhancing autoimmunity.

4. CONCLUSION

Artificial cultivation of Chinese *Myxocyprinusasiaticus* and selection of appropriate mode can improve the efficiency of cultivation and reduce the risk of cultivation. Choosing suitable formula feed can reduce the cost, shorten the breeding cycle and improve the quality of commodities. Optimizing pond design and doing well in water quality control can effectively prevent the occurrence of most diseases.

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