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Current Situation and Suggestions of Decorative Fishery Development in Hainan Province

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Abstract Decorative fishery is an important part of recreational fisheries, Hainan has the potential to develop decorative fishery. In this paper, on the basis of the deep-going survey on the current situation of decorative fishery development in Hainan, the main questions of decorative fish cultivation and market were discussed. At the same time, many suggestions were brought up, such as exploiting the biological resources of Hainan Island, strengthening scientific research efforts, introducing new varieties of ornamental species, strengthening industrial guidance and market management, etc., which will benefit the rational utilization of tropical biological resources and increase the whole competitive advantage of decorative fishery in Hainan Province.

Key words Hainan, Decorative fishery, Current situation, Suggestions

Fishery is an industry covering the breeding, cultivation, water quality control, disease prevention and cure, research and production of nutritional feed and medicine of ornamental organisms in freshwater and seawater as well as research and production of aquarium equipment^[1-2]. In recent years, with the increase in the market share of aquatic animals day by day, decorative fishery has been increasingly strong in China, and the demand for ornamental organisms has increased sharply year by year^[1]. Meanwhile, fishery development is facing a good opportunity and social environment. Located in the tropics, Hainan Province has rich ornamental biological resources and superior natural conditions for breeding and farming ornamental organisms. According to the current situation of decorative fishery development in China, it is necessary to vigorously develop ornamental biological resources based on environmental advantages of Hainan Island, which will benefit the rational utilization of tropical biological resources and increase the competitive advantage of decorative fishery in Hainan Province.

1 Current situation of decorative fishery development in China

1.1 Development status of ornamental organisms in freshwater and seawater Over recent years, as the straightly increase of demand for ornamental organisms in cities all over the world, decorative fishery has become a new industry in the world^[3-5]. In China, Guangdong Province is the main trade center of ornamental organisms and the production center of aquarium Equipment^[1,6]. According to statistics, the breeding area of orna-

mental fish in Guangdong Province reached more than 2 000 hm² in 2008, and there were more than 100 000 people working in ornamental fishery; its annual output value exceeded one billion yuan, accounting for 80% of total market share of ornamental fish in China. In 2006, the trading volume of ornamental fish in Shanghai fishery market reached 53.528 million fishes, and the annual transaction amount was up to 62.014 5 million yuan^[6]. Up to 2008, there were about 150 households breeding ornamental fish in Zhejiang, with around 20 000 workers^[6]. In recent years, decorative fishery has a great potential market in China, and China has increasingly taken part in the international market of aquatic animals^[9-10]. With the popularity of the network, there are more exchange of breeding and farming techniques of ornamental organisms in South China and North China, forming a great trading network of ornamental organisms^[11].

1.2 Development status of derivative products related to decorative fishery Annual trading volume of derivative products related to decorative fishery has increased greatly due to continuous expanding of aquatic animal market^[12-13]. Enterprises producing aquarium equipment mainly distribute in Guangzhou, and its market share accounts for more than 80% of national market share, so it is called "the home of aquarium equipment in China"^[1]. In addition, production of aquarium equipment and sale of derivative products in Zhejiang and Liaoning have been reached a certain scale, and there are more than 150 enterprises producing aquarium equipment and special feed for aquatic animals in Zhejiang Province. With the increase of breeding enthusiasts' demand, aquarium products have been updated more quickly^[14].

2 Current situation and prospects of decorative fishery development in Hainan Province

2.1 Development status Decorative fishery of Hainan has attracted domestic and foreign investors from Taiwan, Singapore, Malaysia and other regions. However, decorative fishery of Hainan has not developed well so far, and the current situation of decorative

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fishery development in Hainan Province is shown as follows^[15–16].

2.1.1 Small scale of ornamental organism breeding. In Hainan Province, freshwater ornamental fishes mainly include map fish and fancy carp. For instance, Guilin Sea in Haikou City has a certain scale of breeding big freshwater ornamental fish, but there is a certain distance to formation of industrial advantage. Other breeding bases of freshwater ornamental fish have a small scale. In Hainan, above 90% of seawater ornamental fishes are fished by people, while the mortality rate of ornamental organisms fished by medicine is low. In addition, a small scale of clown fish is bred in Sanya base of South China Sea Fisheries Research Institute.

2.1.2 Lagging technology and late start of research. In Hainan Province, decorative fishery has developed for a short time and has paid little attention to species introduction and breeding technology. Meanwhile, little investment has resulted in lagging breeding technology, single species, unstable industry and low benefit of ornamental organisms. Additionally, the research of ornamental fishery has started later in Hainan Province. There is a big difference between Hainan and other provinces in breeding high – quality ornamental fish, so that decorative fishery has developed slowly in Hainan.

2.1.3 Insufficient support from the government. The government has paid less attention to decorative fishery and has not planned the development of decorative fishery, so it is difficult to form a certain scale of decorative fishery industry.

2.1.4 Incomplete management mechanism and few professionals. For a long term, Hainan Province has paid more attention to commercial fish in fishery development, but has lacked research and management philosophy about decorative fishery development. Meanwhile, the province neglects the cultivation and introduction of professionals in decorative fishery, and only Hainan University and Hainan Agricultural School have aquaculture major, which has hampered decorative fishery development in Hainan Province.

2.2 Prospects and development advantages With the expanding of aquatic animal market, development of breeding technology of seawater and freshwater fish, and increase in the awareness of enthusiasts for ornamental fish^[17], trade volume of decorative fishery products has raised increasingly, and fishery industry has developed rapidly^[18]. Hainan Province is rich in freshwater, and tropical ornamental fish can be bred and cultivated in the whole year, so many aquarium persons has been attracted by Hainan due to its natural breeding conditions and rich ornamental biological resources.

2.2.1 Rich resources available for development. There are broad reservoirs, islands and harbors in Hainan Island, and it is rich in seawater and freshwater ornamental organisms, so it has a great potential for exploitation. For example, there are 1 064 species of fishes, 1 000 species of shrimps and crabs, about 1 000 of shellfish, 58 species of cephalopods, and 210 species of macroscopic algae in the continental shelf waters; there are more than 200 species of fishes, around 100 species of shrimps and crabs, and 21 species of cephalopods in continental slope^[19–20]. Additionally, 72 species of freshwater fishes (except for anadromous

fish) belong to 57 genera and 15 families, and there are more than 70 species of freshwater fishes in Wuzhishan Nature Reserve with an area of about 15 333 hm²^[20–21]. At present, rich marine resources of Hainan Island have attracted large quantities of practitioners working in decorative fishery to build factory in Hainan Island. In recent years, all ornamental organisms of aquariums in China are from Hainan Province nearly.

2.2.2 Suitable climate. Hainan Province has a tropical maritime monsoon climate featuring warm weather all the year round, and plants remain green throughout the year. Annual average temperature is 25.4 °C, which benefits the development of decorative fishery. Based on the superior natural geographical advantages, research institutes of Hainan Province have made the effort to introduce and breed ornamental organisms.

2.2.3 Extending of aquarium industrial chain Hainan is an international tourism island, which provides the optimal chance for the development and innovation of decorative fishery. Moreover, aquarium products have a high added value, and there are a variety of exploitable tourism products of ornamental organisms. Additionally, aquarium industry is closely related to entertainment, tournament, leisure and tourism, and a unique aquarium industrial chain radiating the whole island can be formed through industrial consolidation.

2.2.4 Marine scientific research institutions have certain research capability and agricultural service system is complete. To develop decorative fishery, nature breeding technology and a variety of species are needed, and scientific research institutions can provide technical support in the introduction and cultivation of new species as well as cultivation of local resources. At the same time, agricultural science and technology 110 service system of Hainan Province will promote the development of decorative fishery.

2.2.5 Rich human resources and huge potential of decorative fishery market. Decorative fishery is a typical labor – intensive industry integrating biotechnology and fine factory management, with a standardized breeding mode, and the management can fully depend on rich human resources of Hainan Province. Meanwhile, as economic and social development and improvement of people's living standard, the demand of people for leisure and entertainment has increased day by day. In China, Hainan Island is the only one ocean shrine where people can take a holiday in the whole year, so it has a big consumer group. Besides, breeding and appreciation of ornamental fish is an important item of leisure and entertainment is closely related to an ocean, so developing decorative fishery in Hainan Island has a wide market advantage and commercial opportunity.

3 Suggestions of decorative fishery development in Hainan

3.1 Introducing high-tech technology to improve breeding technology of ornamental organisms Breeding technology and equipment of ornamental fish in Hainan are lagging, so a long-term planning for decorative fishery in Hainan should be made, and research of seawater and freshwater organisms should be

strengthened^[22]. At the same time, other high – tech technology related should be applied to decorative fishery, which can play important roles in the increase of aquatic animal yield and improvement of decorative fishery.

3.2 Making overall plans and strengthening management

The government and fishery administrative departments of Hainan Province should be aware that developing decorative fishery can not only promote the adjustment of marine fisheries industrial structure, but also increase farmers' income. According to the actual situation of Hainan Province, the government ought to making overall plans for the development of decorative fishery in Hainan and establish some support policies; based on China's national situation, the government should establish the quality standards and management methods of decorative fishery products^[18,22], and combine the establishment of support policies and use of market mechanism.

3.3 Building breeding bases of ornamental organisms and cultivating leading enterprises

According to strategic guidance of the international tourism island in Hainan Province, it is necessary to build breeding bases of ornamental organisms and large – scale farming model to promote development of related industries at the same time. Besides, Hainan Province should cultivate leading enterprises for decorative fishery, set up a special brand of decorative fishery in Hainan Province, and adopt the group mode radiating the whole island and even China to promote decorative fishery development.

3.4 Setting up majors related to decorative fishery to culture professionals^[23]

Aquaculture personnel ought to study advanced breeding technology of ornamental organisms and introduce dominant variety. Meanwhile, Hainan Province should strengthen technical training and set up professional courses about decorative fishery in colleges to culture professionals, so as to solve main technical matters in building breeding bases of ornamental organisms in Hainan Province and further meet the demand of ornamental aquarium market at home and abroad.

3.5 Placing great emphasis on deep combination of scientific research and decorative fishery

To develop decorative fishery well, aquaculture personnel should resort to research institutions to solve the problems about variety breeding and farming equipment improvement, so as to improve their competitive strength and technical content and transform achievements in scientific research into real productivity.

3.6 Widening sales channels and diversifying sales means of ornamental organisms

As the development of information technology, a variety of publicity measures should be adopted, such as network popularization and selling. Meanwhile, the government should build exhibition platforms to popularize ocean and ornamental fish culture^[17]. Besides, based on the advantages of Hainan Island, ornamental organisms are shown and sold in aquariums, sea – view restaurants, wineshops, seafood stalls and so forth. Meanwhile, breeding bases can be as tourist attractions to widen sales channels of ornamental organisms. In addition, the market-

ing team as well as import and export agencies should be established^[1], and various aspects of the production and marketing should be coordinated well to promote sound development of decorative fishery in Hainan Province. In a word, Hainan Province should make full use of its own resources to make decorative fishery have a secure foothold and become one of new economic growth points in Hainan Province.

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