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Tench farming in China: present status and future prospects

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Abstract. Tench, *Tinca tinca* (L.) was introduced as a new species to Chinese aquaculture in 1998. Biological characteristics of tench are studied, and propagation techniques are improved at the Hubei Province Fisheries Institute with co-operation with the Research Institute of Fish Culture and Hydrobiology in Czech Republic and Institute of Hydrobiology, Chinese Academy of Sciences. The first successful artificial propagation of tench in China was made in 2000. The number of produced tench larvae increased from 5 millions in 2001 to 20 millions in 2002, and to 200 millions in 2003. The number of juveniles >5 cm reached 12 millions in 2002 and 120 millions in 2003. Total area of ponds with tench culture was 1400 ha in 2002 and 5400 ha in 2003. Main problems that hinder development of tench culture in China are identified, and future prospects of tench farming in China are highlighted. Abundant water bodies for aquaculture and cheap man-power make the export of tench from China to Europe, USA, Australia and Korea a promising activity.

Present status of tench farming in China

Initial import of tench

Through collaborative efforts of Chinese and Czech scientists, tench, *Tinca tinca* (L.) was introduced to China in 1998. The Hubei Province Fisheries Institute in Wuhan was responsible for initiating the culture of the imported tench and the extensive research on the biology, genetics, propagation and culture techniques of the fish.

Propagation of tench

The research team led by Prof. Jiaxi Wang succeeded in the artificial propagation of tench in the year 2000 in China, only 2 years after the initial import (Wang et al. 2002a). The number of tench larvae increased steadily from 5 million in the year 2001, to 20 million in 2002 and 200 million in 2003. The number of juveniles more than 5 cm reached 12 million in 2002 and 120 million in 2003.

Tench farming and marketing

Following the success in artificial propagation, the Hubei Province Fisheries Institute cultured tench in 10 different fish farms in Hubei in 2000. In the following year, tench farming was started in Ganshu, and Ningxia in western China, Guangdong and Fujian provinces in the south, and Inner Mongolia and Beijing in northern China. By the year 2002, tench farming was extended to many regions throughout China. It was estimated that the total area of ponds with tench culture became close to 1400 ha in 2002 and 5400 ha in 2003. Nearly 200 ha in 2002, and 700 ha in 2003 were devoted to cultures with tench as the major species.

Tench farming developed most rapidly in Guangdong province, where the population has an exceptionally high appetite for various fish products. As the overall economy grows faster there than in other parts of China, the consumers also make more money and can afford to pay more to satisfy their taste for a new fish product. The demand for tench has increased steadily. The initial price for tench was as high as 260 Renmin bi Yuan kg^{-1} (1 EURO $\approx$ 10.5 RMB Yuan). In 2002, the retail price and wholesale price were still 148 RMB Yuan kg^{-1} and 96 RMB Yuan kg^{-1}. With the continuing increase in tench production, retail price and wholesale price dropped to 68–76 RMB kg^{-1} and 32–36 RMB kg^{-1}, respectively, by the end of 2002. However, the price for tench was still much higher than for other fish species widely cultured in China.

Research on tench

Research has been conducted on various aspects of tench since it was introduced to China. People from Hubei Province Fisheries Institute have studied biological characteristics and improved the culture and propagation techniques in order to promote a rapid growth of tench farming in China (Wang et al. 2002b). They have succeeded in gynogenesis of tench and the production of triploid offsprings through genetic manipulation (Wang et al. 2002c). In cooperation with scientists from the Department of Genetics and Breeding of the Research Institute of Fish Culture and Hydrobiology at University of South Bohemia, Czech Republic and with those from the Institute of Hydrobiology, Chinese Academy of Sciences physiology and genetic variations in tench of different origin were studied (Jingou Tong et al. 2002).

Problems of tench farming

Because of the short history of tenth farming in China, the following problems still hinder the development of the industry:

(1) Deficiency in the knowledge of tench biology and the techniques for tench farming among farmers;

(2) Lack of uniformity in larvae or juveniles from some fish farms;
(3) Inconsistent management by the state;
(4) Limited involvement of other research institutes and universities in tench research;
(5) Weak policy support for improvement of tench culture;
(6) Need to develop processing procedures and explore export opportunities.

Future prospects of tench farming in China

Even though the history of tench farming in China is very short, we believe the potential is great for further expansion of tench farming. Chinese consumers' desire for novel fish products will continue to promote the growth for tench market. The price advantages of tench over other traditional carp species will attract more farmers into tench farming. Furthermore, many of the culture systems widely used in China can be easily adapted for tench culture.

Reservoir and pond culture

China has the highest capacity for aquacultural production. There are vast areas of water in the form of ponds, reservoirs or lakes, which are currently used for culturing other species such as common carp, crucian carp and silver carp. Tench can adapt easily to the production conditions prevailing in the Chinese water bodies. Since the price for tench is higher than for the other species, it makes economic sense to replace some of the carps with tench in these production systems. It is estimated that expansion of tench farming alone will continue at least for the next 5 years. Water area used for culturing tench in monoculture or in polyculture with other species may increase to 33,000 ha in China in 2010.

Utility as a sport fish

Tench can be trained to eat pelleted diets. They are caught easily by hook and line, so they can be a desirable choice as a sport fish species. The vivid color variation and delicious taste make them even more interesting. Sport fishing is a rapidly growing hobby for urban populations. It is possible to raise tench in ponds and lakes for people to fish for a fee.

Intensive tench farming

Preliminary experiments in Sichuan, Guangdong and Hubei provinces indicate that tench is suitable for culturing in cages and recirculating systems. With the

application of new technologies including gynogenesis, and the use of triploid fish, more uniform size of fish may be produced through the intensive culture with higher output and better quality, which will increase the profit for the producers.

Export of tench

Tench has a long history of pond culture in Europe and Europeans enjoy its delicious taste. The high labor costs limit the aquacultural production in developed countries. The abundant water bodies for aquacultural production and cheaper labor in China make it possible to produce tench at much lower costs. Consequently, tench produced in China may be exported to European countries, USA, Australia and Korea, where there is a potential market for tench.

New breeding and propagation technology

Hubei Province Fisheries Institute continues to work on selective breeding, hybrid breeding and genome technology of tench. Further development and application of new technologies will further improve the production efficiency and expand tench farming in China.

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