



(<https://debug.globalseafood.org>).

---



Intelligence

---

# Paddy culture: Chinese mitten-handed crabs

1 December 2002

By Qigen Liu and Liqiao Chen

## Environmentally friendly production approach benefits both the crabs and rice

The Chinese mitten-handed crab (*Eriocheir sinensis*) has been the fastest growing aquaculture species in China during the last decade. This migratory species spends most of its 15-month lifetime in freshwater and migrates to brackish water for spawning. Its consumption in the country dates back at least a millennium.

Mitten-handed crabs have been cultured in China for about 50 years. Their production increased over 30 times between 1990 and 1999, and reached 286,000 metric tons (MT) in 2001. The crabs are highly regarded by farmers and in domestic and international markets. Culture of this species is one of the most profitable aquaculture activities in China today.



Increasing production of Chinese mitten-handed crabs has led to price drops and rising demand.

## Culture stages

The culture of *E. sinensis* could begin from the megalopa larval stage, when it can adapt to live in freshwater. However, the survival rate for megalopa larvae in large bodies of water is usually very low, so production is generally divided into the larval culture stage and the grow-out stage.

In the first stage, megalopa larvae are reared for five to six months in a nursery until they become juveniles of 5 to 20 grams called “button-sized” crabs by the Chinese crab farmers. In the second stage, which lasts seven to 10 months, the juveniles are grown to market size in ponds, pens in lakes, or rice paddies. Although production currently comes mainly from pen culture in lakes, paddy culture has also increased rapidly in recent years.

## Culture in rice paddies

Crab culture in rice paddies is an environmentally friendly production approach that has become quite popular. Paddy culture benefits both the crabs and the rice.

The rice plants provide shelter to the crabs and reduce sibling cannibalism, and improve environmental conditions by absorbing the nutrients excreted by the crabs in their waste. An additional benefit to the crabs is that the rice paddy usually attracts insects and other organisms that are natural and nutritious

foods for the crabs. On the other hand, rice plants benefit from the crabs' presence by their manuring and grazing on weeds.

## Construction and preparation

The ditch-and-pit system necessary to a rice paddy often covers 20 to 40 percent of the paddy area. The system commonly includes a ditch around the paddy and about 1.2 meters from the dikes, cross ditches in the central part of the paddy, and pits at the intersections of the ditches.

The ditch-and-pit system is dug after the paddies are ploughed but before the rice seedlings are planted. The ditches are typically 1 meter wide and 0.6 meter deep, while pits are wider, deeper, and square-shaped to hold more water for the crabs when the rice paddy dries up. Dikes are raised to a higher level and strengthened to contain more water than an ordinary paddy. Walls to prevent crabs from escaping are built around the paddy or even the whole farm. Paddies are disinfected with quicklime or potassium permanganate before stocking with crabs.

## Seedstock source and stocking

Distinct local populations of this crab species are defined by their spawning grounds. These groups include the Liaohe River, Yanghzi River and Oujiang River populations.

Crabs from the Yanghzi River population grow to a larger average size and reportedly taste better than crabs from the other populations. Consequently, seedstock from the Yanghzi River population are normally used. Animals of about 7 grams are disinfected by dipping in 4 percent saltwater for five minutes before being stocked in rice paddies at about 4,500 to 6,000 animals per hectare.

## Rice planting

The rice paddies are planted with fewer rice seedlings than typical rice paddies. The distance between rows of seedlings is 20 cm and the distance between the lines is 5 cm.

## Feeding

In March and April, when the water temperature is still below 15 degrees-C, the crabs usually do not eat much. Consequently, it is only necessary to feed the crabs during sunny weather. Rations made of various oil plant meals, rice bran, or fishmeal are fed at around 2 percent of the crabs' body weight (BW). The foods are often made into dough to reduce leaching.

When the temperature rises above 15 degrees-C, the crabs are fed once every three to five days at about 5 percent of their body weight. At this time, various aquatic plants are also planted in the ditches. In May and June, the crabs are fed every day or two at 5 to 8 percent BW.

July to October is the main growing season for the crabs, when animals must be fed twice daily in the morning and evening. The daily food ration increases to 5 to 10 percent BW, with two-thirds of the daily ration applied in the second feeding. More animal food components – including trash fish, mud snails, or clam meat – are added to the crabs' diets. In late October and November, as water temperature decreases, so does the feeding.

## Husbandry management

This production system has both benefits and conflicts. For example, pesticide treatments needed for the rice must be done properly to prevent crabs from being affected or even poisoned to death. The paddies are filled with more water, which is exchanged an hour or two after the pesticide is applied. Quicklime at 40 to 50 ppm is also used once a month to disinfect the water and help the crabs molt.

It is also necessary for the plants to occasionally have dry soil, while the crabs need water. With such constraints, it is crucial to harmonize the needs of both species to have successful crops with both.

## Harvest

The crabs are harvested simply by draining the water at the end of a ditch. Average production from paddy culture typically reaches 300-450 kilograms per hectare.

## Conclusion

Cultured production of Chinese mitten-handed crabs has steadily increased during the last decade, leading to drops in prices and stimulating demand. Although production currently comes mainly from pen culture in lakes, culture in rice paddies has also increased.

Because of its environmentally friendly nature, crab culture in rice paddies will likely continue to grow. Pen culture may be scaled back due to the impact of crabs grazing on aquatic plants and organic loading from crab wastes and uneaten feeds.

*(Editor's Note: This article was originally published in the December 2002 print edition of the Global Aquaculture Advocate.)*

## Authors

---



### QIGEN LIU

East China Normal University  
North Zhongshan Road  
Shanghai, China

[qgliu@shfu.edu.cn](mailto:qgliu@shfu.edu.cn) (<mailto:qgliu@shfu.edu.cn>)



### LIQIAO CHEN

East China Normal University  
North Zhongshan Road  
Shanghai, China

Copyright © 2023 Global Seafood Alliance

All rights reserved.