
Preliminary results of domestication of *Pangasius krempfi*

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ABSTRACT

Pangasius krempfi is a species of high-economic value in the Mekong Delta of Viet Nam. The AIMS Viet Nam Sub-component is collecting the wild fish at various sizes for domestication and later on for artificial propagation. Preliminary results showed that 100% mortality was found when fish were stocked in ponds, whilst much high survival rates (90%) were observed among fish stocked in cages. Currently, we can be confident that cage culture is an appropriate environment for the normal grow-out and sexual maturation of *P. krempfi*.

KEYWORDS: *P. krempfi*, collection, fishing method, pond, cage.

INTRODUCTION

The Krempf's catfish *Pangasius krempfi* (Fang & Chau, 1949) is an interesting fish for its anadromous characteristics (Roberts and Baird, 1995). The species is found throughout the Mekong basin and in the coastal waters of Southern and Eastern Viet Nam. There are two reported populations of *P. krempfi*, appearing in the Upper and Lower Mekong Basin. Both populations extend to middle Mekong (Poulsen *et al.*, 2004).

Adult fish fed mainly on fruit, leaves, filamentous algae and crustaceans. At the first stage of its life-cycle, juveniles of the lower population move to the marine environment in the Mekong estuarine zones (Poulsen *et al.*, 2004).

The spawning sites of *P. krempfi* are still unknown. The lower population spends some of its time in marine habitats at certain periods in its life cycle (Poulsen *et al.*, 2004).

P. krempfi is of economic value in the Mekong Basin (Poulsen *et al.*, 2004), probably because of its excellent taste. It is of great interest in Cambodia, Lao PDR, Thailand and Viet Nam. Since 2002, the fish has been a target species of the Aquaculture of Indigenous Fish Species (AIMS), Mekong River Commission, Fisheries Programme. The basic objectives of our work are (i) to keep the fish alive in captivity and (ii) to cultivate them to a condition and stage of maturation where they can be artificially spawned.

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METHODS

Location of collection of wild fish

We first collected wild *P. krempfi* at Tan Chau district, An Giang Province (upstream of the Mekong River in Viet Nam) in April 2003. The fish were caught using a net placed in deep water (approximately 30 metres deep).

Because of the massive mortality encountered during the capture of fish in upstream areas, the site for collection of wild *P. krempfi* moved downstream to the estuary, located at Tran De, Soc Trang Province. Unlike in An Giang Province, fishermen at Tran De used hooks to catch the fish.

The Tran De location was used to catch the fish from August 2003 to July 2005.

Transportation method from the fishing areas to Cai Be Center

After capture, the fishermen moved the fish immediately to a holding cage and provided aeration (at Tan Chau, An Giang), or moved them on-shore to tanks with freshwater and good aeration (Tran De, Soc Trang Province). After 3 to 4 days, we transferred only the healthy fish to either the National Breeding Center for Southern Freshwater Aquaculture Centre (hereafter called Cai Be Centre), or to a private cage facility located in Cao Lanh Town, Dong Thap District.

Prior to transportation, we anaesthetized and weighed the fish. We cut the first spine of the pectoral fin of small fish, or covered this spine with a piece of plastic tube if the fish was large. This spine is believed to be poisonous and, more importantly, can easily puncture the plastic holding bag, resulting in leakage's of water and air.

We then packed the fish into plastic bags encased in steel circular containers. The bags were filled with pure oxygen and tied with string. We transported the fish to Cai Be Center by van or a pick-up.

We transferred most of the fish collected in 2003 and 2004 to Cai Be Center, and some of them (115 individuals) to a private cage facility near to Cao Lanh Town, Dong Thap District.

We transferred all the fish caught in 2005 to the newly-purchased cages (8 × 4 × 3m) provided by the AIMS Project, Viet Nam sub-component, located in My Long District, Dong Thap Province, 16km from Cai Be Center.

RESULTS

Results in 2003

There were 28 fish collected at Tan Chau, Hong Ngu. Most of them died shortly after removal from the water. Few of the ones that survived died shortly afterwards at Cai Be Center.

We obtained many more fish at Tran De, Soc Trang. From August 17th to December 17th 2003, we collected 120 fish. However, on January 29th 2004 we found that only 6 fish had survived at Cai Be Center.

Results in 2004

From February 12th to March 30th, we collected 334 fish at various sizes. By the month of May, all of these fish had died.

In June, a further 127 fish had been caught. We moved 12 of them to Cai Be, and the rest to a private cage facility in Cao Lanh, Dong Thap.

At the end of August there was only a single fish remaining alive at the Cai Be Centre, but 25 fish survived in the cage facility at Cao Lanh.

Results in 2005

We restarted the capture of more fish from April 7 until June 28 2005. In total we captured 420 fish. The sizes varied from 0.05 to 3.7 kg. All the fish were stocked in the newly purchased AIMS facility cages at My Long, Dong Thap.

At the end of the year the mortality was found to be only 8.6 per cent. The weights of the remaining fish ranged from 0.4 to 5.0 kg and they appeared to grow very well.

DISCUSSION

Fish caught by net in Tan Chau, An Giang showed almost 100 per cent mortality, probably because of the fishing method used. Fish caught by net at approximately 30 m depth probably contributed to mortality during capture. Once the fish were brought to the surface, most of them were very much entangled in the net, and by the time the fishermen removed them from the net they were nearly dead. Also, the change in hydraulic pressure resulting from retrieval may have caused some mortality.

Once the capture procedure was moved to the estuary, where the fishermen caught *P. krempfi* by using hooks, the survival rate of the newly-caught fish greatly improved. The fish were subjected to less stress, since the time to remove them from the hook was shorter. Also, the water depth where the fish were caught (based on the length of the fishing line) was much less than that in Tan Chau. Thus the newly caught fish were in better condition.

Keeping fish in fresh-water in aerated tanks showed no negative effect on the fish. Mortality during this period was much reduced.

At Cai Be Center, *P. krempfi* showed that they are poorly adapted to pond conditions. They may not adapt to static water conditions very well. Under these conditions, the fish stopped eating or only consumed small amounts of food. Starvation was thought to be the main reason that caused nearly 100 per cent mortality of *P. krempfi* in ponds.

P. krempfi also showed that they are extremely sensitive to sampling and handling. Many fish died shortly after transportation to ponds and during sampling. The survival (in ponds) was very low, and was probably caused by altered environmental conditions and non-natural diets. Many fish died shortly after stocking.

Fish stocked in a private cage facility in Cao Lanh, Dong Thap showed that they can survive in a moving water environment, but they showed poor growth. The fish were stocked together with *Leptobarbus hoevenii*. The poor growth of *P. krempfi* can be explained due to its inability to compete for food with *L. hoevenii*.

Ideally a cage facility should be devoted to *P. krempfi* raised in a monoculture. During trials where this took place, the result was quite obvious. After more than half a year, mortality found in the AIMS Project cages were just only 8.6 per cent. Fish observed in this type of cage system adapted relatively fast to a pellet-type diet.

CONCLUSIONS

After three years of trial and error, we can be quite confident to say that *P. krempfi* can only be cultured in moving water, that is, a cage. We found nearly one hundred per cent mortality when we stocked fish in ponds. Many kinds of feed (home-made feeds and pelleted feeds) have been experimented with in ponds stocked with the target species, but they all failed. In contrast, fish utilise pelleted feed well in cages and have shown good growth. Thus, the culture environment is likely the single most important factor to ensure fish survival and growth rate. This is the first time in the Mekong Delta that *P. krempfi* has been kept and grown in captivity.

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