www.sabujeema.com

SABUJEEMA

An International Multidisciplinary e-Magazine

Volume 1| Issue 5 | August, 2021

FARMING OF CLIMBING PERCH OR ANABAS KOI (ANABAS TESTUDINEUS) A BOON FOR SMALL AND TEMPORARY POND FARMERS

- B. Ramji and S. Aanand

"Read More, Grow More"

Sabujeema Sabujeema

editorsabujeema@gmail.com

sabujeema-international multidisciplinary-e-magazine

Volume 1 - Issue 5 – August, 2021
SABUJEEMA
An International Multidisciplinary e-Magazine

FARMING OF CLIMBING PERCH OR ANABAS KOI (ANABAS TESTUDINEUS) A BOON FOR SMALL AND TEMPORARY POND FARMERS

[Article ID: SIMM0116]

B. Ramji
Fisheries College and Research Institute, Thoothukudi.

S Aanand
Erode Bhavanisagar Centre for Sustainable Aquaculture, Bhavanisagar, Erode

INTRODUCTION

The climbing perch, *Anabas testudineus,* is a valuable air-breathing fish and is considered a delicacy in India's eastern, northeastern and southern states. Demand for this fish is very high for its delicate flavor, extended freshness when taken out of the water, and an appreciated diet for sick and healing. The fish has a widespread dispersal range in the freshwaters and is predominant in the derelict and swampy waters. Its natural distribution ranges from India and China to Cambodia. In India, it is famous as 'Kavai' in Hindi,' Kou' in Orissa, 'Koi' in West Bengal, Kai' in Assam, etc. It is a chosen fish with a high market price (300 – 500/ Kg) in many states like West Bengal, Tripura, Assam, Bihar, Orissa, and even southern India. Climbing perch contains high quantities of physiologically available iron and copper essential for hemoglobin synthesis. In addition, it also includes all the essential amino acids (Saha 1971). Due to its air-breathing ability and acceptance to a wide range of adverse environmental conditions, the fish can be a suitable candidate species for culture in the water bodies where carps cannot be cultured. Anabas can be reared or cultured in large tanks and ponds to control aquatic insects and weed fishes. The climbing perch lacks seed production and larval rearing techniques; hence, farmers have not given much consideration.

Significant features of Anabas testudineus

- High demand Anabas fish fetching good market value year-round
- High tolerance to environmental conditions and low mortality rate
- high stocking densities are possible
- It can be cultured in a small pond or cage
- Has a short culture duration of 3-4 months
- Multiple crops in a year are possible
- Less susceptible to diseases
- Requires low capital investment

BROODSTOCK MANAGEMENT

The conservation of healthy brood fish is a prerequisite for effective seed production in confinement. The brood fishes collected from culture ponds or wild, stocked in cement tanks @ 15 / sq.m (40-100 g) and fed with a mixture of feed ingredients such as fish meal, groundnut oil cake, soybean meal, and rice bran augmented with vitamin and mineral mix and protein content of approximately 30%. The fish are fed twice daily @ 5% of their body weight. Maintain

good water quality through frequent replenishment of the same. In culture conditions, *A. testudineus* attains sexual maturity in the first year, reaching 15 - 20 g weight and 8.0 - 10 cm in length.

SEXUAL DIMORPHISM

Male and female fishes showed sexual dimorphism during the breeding season. Generally, females are enormous, especially during spawning, while males are darker in colour and have more of a knife-edged anal fin. Among other features of sexual dimorphism, the pectoral fins of the male become rough during the breeding season. Males have pointed genital papilla of the male is pointed and narrow, with free oozing milt on applying gentle pressure on the abdomen. The pectoral fins are smooth and have swollen pinkish genital papilla, bulging, and soft belly in the female. Induced breeding of Climbing perch is possible with hormone administration.

BREEDING

The breeding season for climbing perch starts from April and lasts until late August, with a peak in May-June. Fish weighing 40-80g are taken out of the broodstock tanks and kept separately in FRP tanks for breeding purposes. For breeding, the suggested sex ratio is 2:1 (male: female). Administer Ovaprim @ 0.5ml/kg for induced breeding with high fertilization, hatching rate, and survival rate (Rahman et al., 2021). The courtship starts 6 hrs after injection. The male wraps around body of the female body during spawning and fertilizes the eggs. Unlike other anabantids, climbing perch does not build a nest to protect its eggs,. A female releases a minimum of 4000 eggs and a maximum of 68000 eggs; with an estimated fecundity of about 350 – 400 eggs/ g of body weight.

In the case of Wova-FH, the experiment suggests that a dose of 0.3mL/ kg body weight of fish is more effective, and fecundity is about 52000 to 130 000 numbers (Uttam Kumar Sarkar et al., 2005). Under captive conditions, the fish respond to induced breeding at any desired time by adjusting the administration time. The fertilized eggs are tiny, almost circular, and lighter than water, measuring about 0.82mm in diameter after water hardening. They float on the surface and look like non-adhesive tiny crystal beads. Viable living eggs are transparent, while the unfertilized eggs are opaque or milky. On average, a female weighing 50-60 g may produce 10,000 - 12,000 eggs. Incubate fertilized eggs in Plastic tubs/FRP tanks. The time duration from hormone administration to hatching out is about 22-26 hours depending upon the water temperature, maintained at 26-30°C.

LARVAL PHASE AND SEED REARING

The newly hatched larvae measure 1.6 – 2.0 mm in length. Absorbtion of yokd sac is completed within 96 hrs and larvae rest in an upside-down position. They are reared in indoor rearing tanks (500 L) with a water depth of about 40 cm, depending on the size of the juvenile fish. Filtered water in rearing larvae prevents entry of large plankton, which are potentially harmful. Feeding starts by the third day as they have two to three days of food available from their yolk sac. Covering the water surface up to 40% with floating aquatic plants like *Pistia* and *Eichhornia* improves larvae' survival and growth rate. The root of these plants provides sufficient food in terms of periphyton and absorbs harmful gases that accumulate in the water during rearing. To increase the survival

rate, identifying acceptable feed and particle size during rearing is essential. For two weeks, the three-day-old spawn is fed with thoroughly sieved zooplankton to avoid the entry of Cyclops, Daphnia, and other large zooplankton. It is vital to maintain suitable environmental conditions for better growth and survival of the larvae. Regular water exchange, feeding, and thinning of stock density are essential. A stocking density of 1000 - 1500/m^2 is ideal for the first three weeks for better growth and survival under indoor captive conditions (Kuldeep et al., CIFA., 2012). After 20 days of rearing, the spawn attains a size of 12-16 mm. They can be fed with total plankton at this stage, avoiding only anisops and larvae of some aquatic insects. In another ten days, the fry grows to a size of 20 mm when they can be fed with supplementary feed consisting of rice bran, soybean flour, groundnut oil cake, and fishmeal with a 30-35 % protein level. The difference in size groups is mainly due to food consumption. At this, segregate the faster growing, 'shooter' fry from the others at regular intervals to avoid mortality due to cannibalism. The survival rate is very high when the seed is reared in cement tanks (3 x 5 meters) with low water depth (75 cm) and formulated feed. Transfer the fry later to large cement cisterns with a soil base for the rearing of advanced fry. Raw cow dung is applied to develop natural food supplies for the fry, with stocking density @ 50-60 fry/m^2 (Kuldeep et al., CIFA., 2012).

At this stage, the larvae are tiny and delicate, so they need an excellent rearing system and proper water management for optimum survivability. The accumulation of metabolites and unutilized feed in the rearing tanks deteriorate the environment and ultimately lead to oxygen depletion causing disease and mortality. Therefore, regular water exchange is essential. Feed consisting of agricultural by-products and fish meal in fixed ratios serve as good feed. During the first two months of rearing, the seed attains 35 to 40 mm and becomes ready for stocking.

GROW OUT PHASE

Culture in pond

A smaller size pond of 0.05 -0.2 ha is ideal for grow-out of climbing perch. Pond management entails comparable steps to those followed for carp farming. Climbing perch ca walk from one pond to another pond during the rainy season. Hence, a pond dyke of 75-degree angle, helps prevent the escapement. Usually, climbing perch are reared in monoculture or with other air-breathing fishes. In a monoculture system, the recommended stocking density is 5 to 6 fishes/m^2. Supplementary feeding @ 3-5% body weight is essential with regular monitoring of water quality. Climbing perch is primarily insectivorous, so fixing a hanging light just above the tank/pond/cage is a perfect way to attract insects, which provide an additional source of food when they fall on the water surface.

Climbing perch recurrently comes up to the water surface for another gulp of air, and this behavior makes them vulnerable to predation by birds. Hence, the pond should be covered with net or bird scaring devices to avoid predation by birds. The fish attains marketable size (50- 60 g) in one year. For harvesting fishes, dewater the pond, and fishes are collected by handpicking.

Culture in Cages

Rearing of climbing perch in cages (3m x 2m x 1.5m) with 550 nos/cage is an alternative method. Feeding with natural feeds, supplementary feeds can improve the growth

rate and fish grows attains an average weight of 62g in 4 months. Climbing perch of Tai strain is suitable for monoculture and polyculture conditions. The stocking density of 60 nos/ m^2 (5.8g and 12cm) is preferable for monoculture with a survival rate of 67 percent, and it reaches 40g (6.1cm) in 4 months. Production output ranged from 0.3 to 1.0 kg/m2 depending upon the density, culture period, and survival, suggesting that this high-value species has potential for farming in cage systems (Kuldeep et al., CIFA., 2012). A cage (1m x 1m x 1m) with150 fishes/m^3 showed promising growth, yield, and survival rate (Habib et al.,2015). A cage (3m x 3m x 3m) with 60 fishes/m^3 is also desirable for anabas koi culture (Uddin et al., 2016).

CONCLUSION

Anabas fish farming is very easy, suitable for small and temporary farm ponds. India considering the dependence on monsoons for water most farmers can consider this species for culture in dry areas were water is available for few months in a year. Artificial propagation is readily available, and popularising culture techniques would reduce pressure on the wild stock and also form an additional species for culture among fish farmers.

REFERENCES

Amornsakun, T., Sriwatana, W. and Promkaew, P., 2005. Some aspects in early life stage of climbing perch, Anabas testudineus larvae. Warasan Songkhla Nakharin (Sakha Witthayasat lae Technology).

CIFA, 2016.Training programme on "Seed Production of Anabas, Magur and Murrel" 26-30 August 2016. Central Institute of Freshwater Aquaculture, Bhubaneswar, India.

Habib, K.A., Newaz, A.W., Badhon, M.K., Naser, M.N. and Shahabuddin, A.M., 2015. Effects of stocking density on growth and production performance of cage reared climbing perch (Anabas testudineus) of high yielding Vietnamese stock. World J. Agric. Sci, 11(1), pp.19-28.

Rahman, M.I., Islam, M.S., Hossain, M.S., Ali, M.R., Das, B., Hossain, M.A. and Iqbal, M.M., 2021. Induced spawning and larval development of Vietnamese koi, Anabas testudineus (Bloch, 1792), using salmon gonadotropin releasing harmone analogue (S-GnRHA). Indonesian Aquaculture Journal, 16(1), pp.21-27.

Kuldeep, K., Mohanty, U., Kumar, R., Damle, D., Noor, J., Jena, J.K. and Eknath, A.E., 2012. Culture of freshwater climbing perch, Anabas testudineus. Aquaculture Asia Magazine, 17(3), pp.27-28.

Juvenile

Seeds of Climbing perch

Adult Climbing Perch