

# Tuticorin District of Tamil Nadu, India

Linga Prabu, D.<sup>1</sup> and M. Kavitha<sup>2</sup>

1. Growel Feeds Pvt. Ltd., Andhra Pradesh, email growelprabu@gmail.com; 2. Aquatic Environment and Management Division, Fisheries College and Research Institute, Tuticorin.

Culture of fresh water ornamental fishes is an important aquaculture activity in Tuticorin District of Tamil Nadu, India. In Tuticorin District there are six large ornamental fish farms and approximately twenty-five small ornamental fish breeders engaged in the business. The culture and breeding of cichlid fish varieties is the main activities of these farms. Tuticorin is the only place in the state where all the important cichlid varieties are cultured and supplied throughout the state and supports an export market as well. Tuticorin has many with salt pans and naturally grown *Artemia* biomass is available for brooders with the only expense for collection. Therefore, culture of cichlid fish varieties is abundant in this area, including Oscar, flower horn, discus, severum, angel fish, red devil, zebra cichlid, fire mouth, frontosa, peacock lemon cichlids, which are actively bred and cultured. A relatively new addition to the area is the blue eyes cichlid.

Blue eyes, *Archocentrus spilurum* is a Central American fish species. It is considered a relatively peaceful cichlid and it is not very fussy when it comes to water conditions and temperature. Among the cichlids, blue eyes are suitable for community tank because of its peaceful nature. It may not be the most colorful, but they are very pretty little fish and their blue eyes set them apart from other cichlids. In nature it prefers shallow areas with sand, mud and rock substrates as well as slow moving waters of the lower riverine valley areas. Hence, vigorous water movements are not necessary in the aquarium. It inhabits the middle and bottom regions of the tank.

Blue eyes have a pinkish-grey body colour with yellow extending from the underside of the mouth through the throat and into the belly. They have a fairly stocky, deep body, with a short, gently sloping forehead ending in a small, pointed, terminal mouth. Also have seven or eight vertical black stripes, often faint in males, on the body. More pronounced are the black spots midway on the body that start just behind the gills and run the length of the body to the tail. A band running from the eye to the corner of the mouth is often present. The dorsal fin has light aqua streaks through it and is tinged light maroon or vivid red colour. The caudal fin is spangled blue close to the caudal peduncle, less towards the



Male blue eyes brooder.

edge. The anal fin is aqua blue in colour. Females are smaller than males. Usually males grow about 12cm and females to around 8 cm. Even though, males can attain a maximum length of 18 cm.

## Food and feeding

Blue eyes are an omnivorous fish. They are not most selective about what they eat. They will readily accept *Artemia* biomass, chopped animal flesh, frozen foods (beef heart, spleen and kidney), flake foods and commercial pellet feeds with sufficient quantity of fishmeal (2mm diameter) produced for other aquaculture species. They relish live black worms, blood worms and *Artemia*. They should be fed with twice or three times a day.

## Compatibility

Blue eye cichlids can be set up in community tanks with compatible species in a minimum 100 cm tank. They are peaceful and can be kept with similar kind of fishes. This fishes are relatively easy to maintain in aquariums. During breeding season, males may be aggressive towards each other but they will not disturb other fishes in the tank. Blue eyes are suitable for community tanks with nearly any sized fish, although very small and fancy finned species should not to be put together in community tank. Normally blue eyes are introduced in the community tank along with the red devil cichlid (*Amphilophus labiatus*), salvini Cichlid (*Nandopsis salvini*), blue dolphin cichlid (*Haplochromis moori*), callichthyid armored catfish (*Megalechis personata*), orinoco sailfin catfish (*Liposarcus multiradiatus*), youcatan molly (*Poecilia velifera*), guppy (*P. reticulata*), sword tail (*Xiphophorus helleri*) and fish of the family Pimelodidae (Long-whiskered catfishes).

## Water quality maintenance

Like other cichlids fishes, this fish species can be maintained in a cemented culture tank (5m × 4m × 1m). This fish grows best at temperature ranges of 24–32°C. Temperature plays a major role in growth as well as timing and intensity of spawning. The pH may be maintained slightly acidic (6.5) to alkaline (8.0) condition for its better growth and breeding. The tank should be facilitated with sufficient aeration to provide at least 5ppm dissolved oxygen. The fish requires fairly soft water and the hardness should not increase beyond 100 ppm level. The culture tanks should be maintained with less level nitrite and ammonia since blue eyes are also highly susceptible to elevated levels of ammonia particularly unionised ammonia. The culture tank should be provided with plenty of hideouts such as concrete pipes. The best medicine for prevention of any disease is achieved by avoiding overcrowding and sufficient water exchanges from the tank according to needs.

## Breeding

Matured males develop a pronounced hump head and also have longer filaments on the dorsal and anal fins. Females have more pronounced black strips on the body and one of these bars will extend into a dark spot located at the dorsal fin. Males are more colorful than females. Spawning occurs very soon after the fish starts displaying breeding coloration. During the time of spawning, the golden yellow throat and belly colour is replaced with jet black and ventral fins too become black. The female loses its stripes and both male and females develop a horizontal striped pattern on their sides. Blue eye cichlids usually form monogamous pairs.

The spawning tank should be provided with small flower pots kept in such a way that it could not roll, laid on its side. Before breeding, the pair engage in body quivering and tail slapping, after these, they start cleaning the flower pot and then start to spawn in it. The female starts laying its eggs on a vertical surface. Usually, it may lay 100–250 eggs. After releasing the eggs both parents may clean off dust particles and any detritus that deposit on the eggs and aerate them using their fins. The eggs hatch after 65–72 hours of incubation. When the eggs have hatched, the fry will feed from their egg sacs and stay closely together to the side of the wall. The fry will



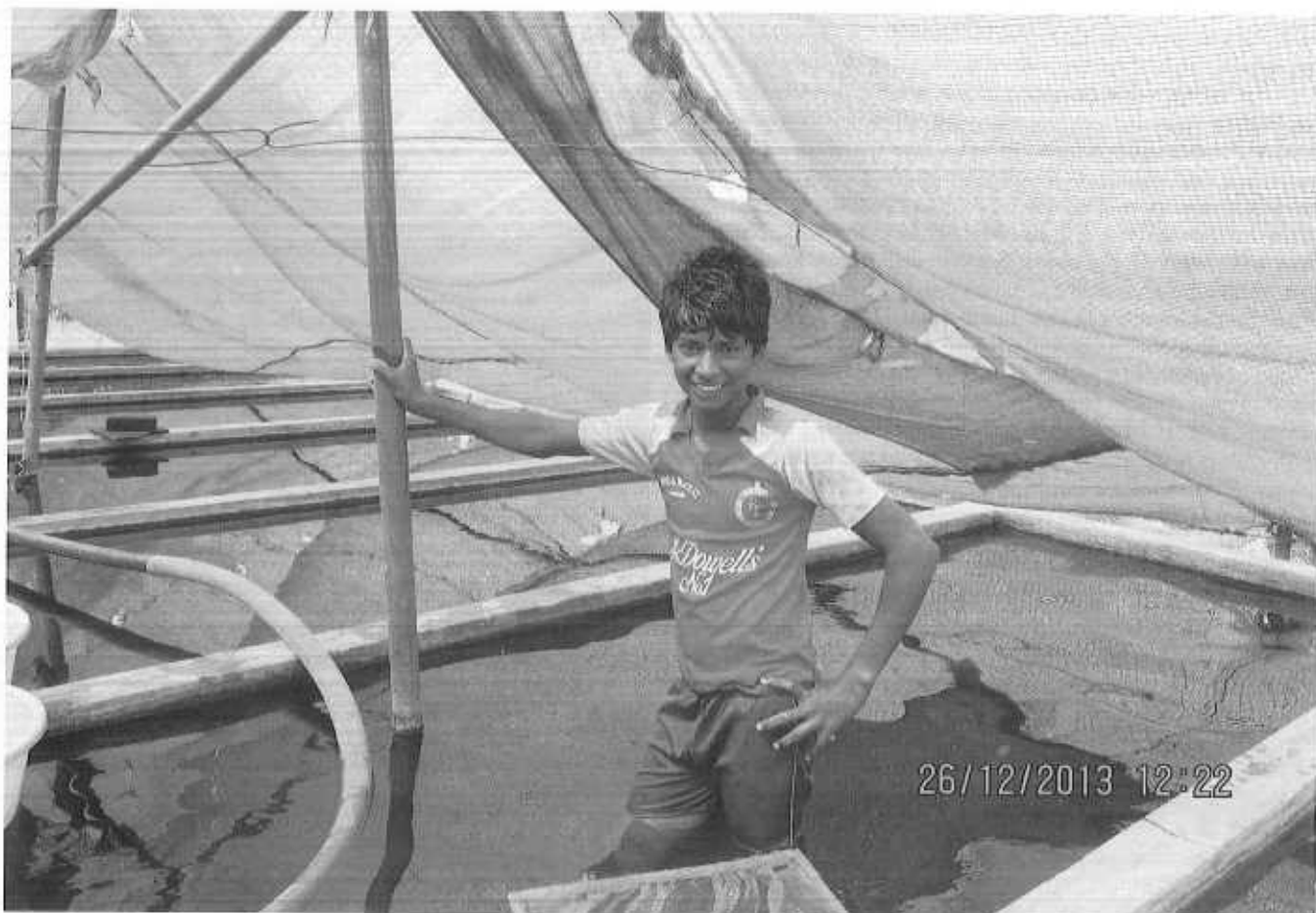
Releasing the yolk sac larvae from a blue eyes brooder.

become free swimming within a week after hatching. By this time, they will be about 5–7 mm in length. Both parents spend their entire time with the young ones during this time.

From a commercial point of view in order to reduce such long parental care, Tuticorin aquariculturists usually remove the pot containing eggs and transfer it to a hatching tank. This practice is followed to increase the number of spawning cycle in a year. Otherwise, the eggs can be removed from pots by applying a locally proven non-sticky herbal formula (pineapple juice along with some other herbal juice) and transfer them to a jar hatchery which is used to incubate the eggs and minimise the space requirements. After hatching the sac fry are transferred to rectangular water trays made of mild steel. As soon as the egg sacs become empty the fry start feeding on the *Artemia* nauplii, fishmeal and powdered flake food. After a certain time they can feed on rotifers, adult *Artemia*, *Daphnia*, *Moina* and small sized crumbles and pellet diets (0.75–1 mm diameter). Regular water exchange is necessary to keep the water quality in good condition, but should not exceed more than 25% of the water per time, since large water exchanges possibly affect the survival of the fry. During water exchange, care has to be taken to use the water of same temperature.

## Disease Management

Like other ornamental fishes blue eyes are also susceptible to the following diseases and the following practices are adopted by the innovative farmers of Tuticorin district. Hole in head disease is a disease caused by a protozoan parasite *Hexamita*. The disease is identified by white colour, slimy



The boy working in the farm standing in the blue eyes brooders tank.

faeces and the presence of "hole in the head". The symptoms of this disease are often confused with similar symptoms of nutritional deficiencies. The disease is treated with common aquarium anti-parasitic agents. Lymphocystis disease is a viral disease. Treatment is difficult and affected fishes should be separated. Dropsy or kidney bloat is a disease caused by one of several gram negative bacteria commonly present in aquarium habitats. As the infection progresses, skin lesions develop, the belly fills with fluids and becomes swollen, internal organs are damaged, and ultimately the fish will die. The disease is difficult to cure but salt treatment may be useful in the initial stages.

Saprolegniasis disease is caused by *Saprolegnia* fungi. The fishes appeared to have a "cotton wool" matted mass growing out of the skin and scales. The fish have to be removed from water and the lesions with an aquarium anti-fungal agent. Argulosis and Lernaeiasis are the disease caused by crustacean parasites namely *Argulus* sp. and *Lernaea* sp. respectively. The infected fish rub violently against walls of the cement tank due to irritation. Treat the fish in 1-2% bath of potassium permanganate ( $KMnO_4$ ) for 15 min bath, and painting the affected region with iodine solution will shows fast remedy.

## Market value

Blue eyes, being an exotic fish variety, have been marketed domestically throughout India. In the domestic market it fetches various prices based on its size. It may not be too colorful and being moderate sized fish, a pair has a value of

Rs. 250–450 based on their size and coloration. The consignments are usually transported to Kolkata and Chennai via train routes and sometimes directly exported to Singapore by air from Tuticorin Airport.

## Conclusion

Blue eyes as a relatively less aggressive cichlid draw good interest among fish hobbyists that prefer community tanks. Among the culturists at Tuticorin District, blue eyes draws special attention because of their easy breeding nature compared to other cichlid varieties, as well as the easy availability of *Artemia* biomass and adaptability of the fish to commercial carp pellet feed. This is the secret of success for blue eye breeding and culture in Tuticorin area of Tamil Nadu.

## References

- Skomal, G., 2001. Setting up a freshwater aquarium: An owner's guide to a happy healthy pet, second Edition., Howell Book house, Wiley Publishing. Inc., New York, 126pp.
- Wayne Toven, 2000. Old blue eyes: Spawning *Archocentrus spilurum*: In: Tank topics, Greater Akron Aquarium Society.
- Prabu, D.L., S.A. Sudhagar and S. Ferosekhan, Blue eyes: A suitable community tank cichlid, Aquafind.
- Axelrod, and R. Herbert, 1997. Dr. Axelrod's Atlas of freshwater fish, THF Publications, Neptune, New Jersey.