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Induced breeding of Iridescent Shark at the National Zoological Gardens, Sri Lanka

Adult Catfish *Pangasainodon hypophthalmus* in aquarium, National Zoological Garden, Dehiwala.

Striped Catfish or Iridescent Shark *Pangasianodon hypophthalmus* is a highly popular omnivorous fish with a high growth rate. They are schooling fish which makes a delightful display in an aquarium. This fish does not reproduce in natural or captive environments in Srilanka. Therefore, they have to be induced using artificial techniques in order to get offsprings. This study was conducted to explore the potential of captive breeding of Striped Catfish using artificial induce technique.

Broodstocks with an average length of 35cm were collected from the holding tanks of the National Zoological Garden (NZG), Dehiwala. Once the gravid females and males were identified, they were subjected to hormone treatment. Separate hormonal treatments of the synthetic hormone Ovaprim was given to the males and females. Two doses of 0.5ml/kg were given to the females in an interval of six hours and the males was given one dose of 0.5ml/kg body weight at the time of the second injection given to the female. Stripping was considered as it is the best technique to fertilize the eggs and the dry method of egg fertilization was followed in trials. The fish responded positively and ovulated within 5–6 hours after the second injection. An average of 150,000 eggs were recovered from the female. Fertilization rate ranged from 85–95%. The hatching period ranged from 24 to 26 hours at a water temperature of 28–32^{0}C. After 10 days, a black body colour appeared in the hatchlings and they started to feed rapidly on Artemia and egg yolk.

The results of the present study would help the hatchery managers in managing the induced breeding programs of *P. hypophthalmus* and other catfishes. It will help to fulfil the rising demand for Striped Catfish in ornamental culture trade.

The Iridescent Shark *Pangasianodon hypophthalmus* is a species of Shark Catfish (family Pangasiidae) native to the rivers of southeast Asia.

Iridescent Sharks originate from the large rivers Chao, Phraya and Mekong in Asia, though they have been introduced into other rivers for aquaculture. They are freshwater fish that natively live in tropical climate and prefer water with a 6.5–7.5 pH. The fins are dark grey or black. Juveniles have a black stripe along the lateral line and a second black stripe below the lateral line; they have a shiny, iridescent color that gives these fish their name. However, large adults are uniformly grey and lack the striping. Adults reach up to 130cm (4 ft) in length and can weigh up to a maximum of 44kgs (97 lb).

Methods

Breeding and hatching experiments were carried out in the NZG, ,Dehiwala. Male and female brooders were selected from the aquarium of the NZG. Physio-chemical parameters of the water were analyzed before the experiment. For inducing breeding, mature and gravid males and females were selected in the age group of 2.5(+) years. Ovaprim was administered at 0.5ml/kg to the females twice and 0.5ml/kg once to the male brooders. Injected brooders were kept in cemented breeding tanks of size (4×2×1 m) with flowing water. The fish responded positively and ovulated within 5–6 hours after the second injection.

Injecting *Pangasainodon hypophthalmus* with Ovaprim.

Table 1. Physio-chemical parameters during the breeding experiments at NZG, Dehiwala.

Name of the parameter	Value
Dissolve oxygen (mg/l)	4.2
Air temperature (°C)	30.5
Water temperature (°C)	29
Salinity (ppt)	0
Weather	Sunny

Result

Physio-chemical parameters of the water during the breeding experiments have been summarized in Table 1. Results of the breeding trails on *P. hypothalamus* conducted at the NZG have been summarized in Table 2.

Conclusion

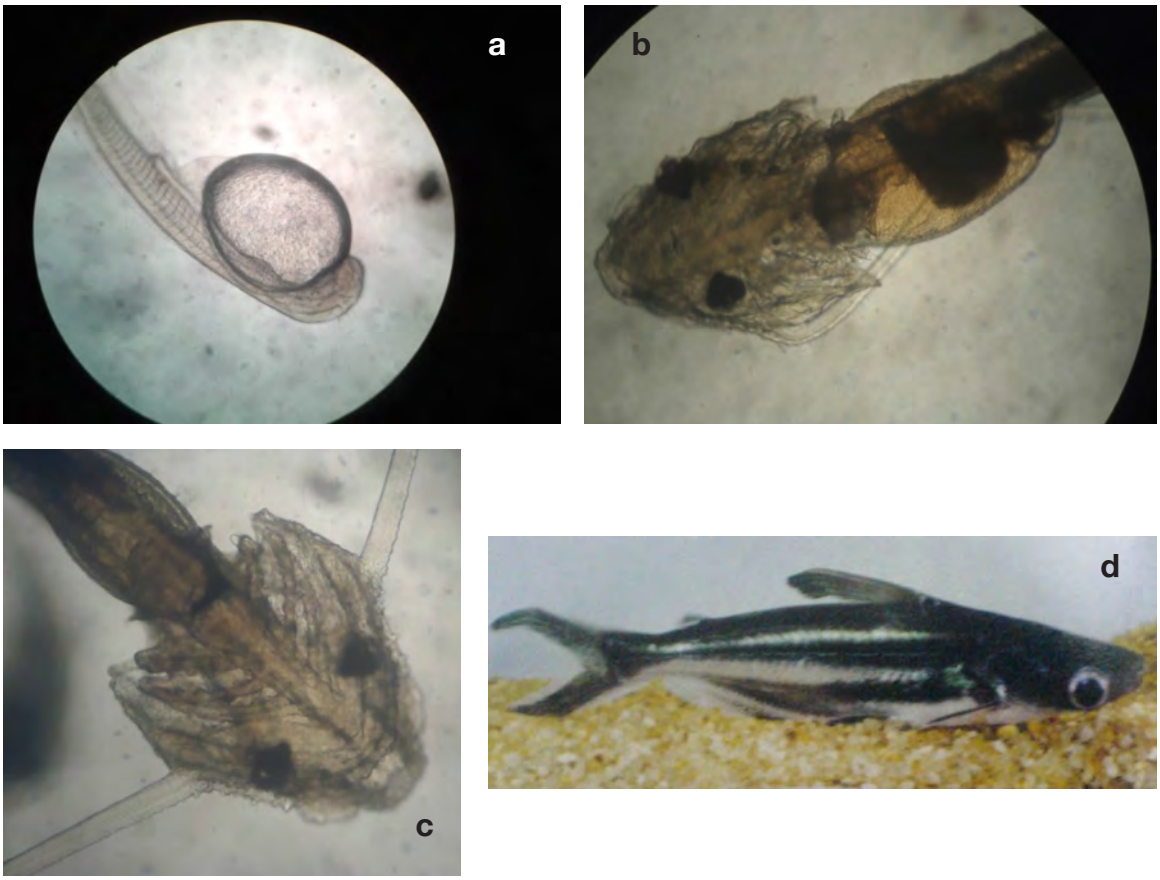
A single preparatory and decisive Ovaprim dose of 0.5 mL/kg body weight for females and single Ovaprim dose of 0.5 ml/kg for males succeeded in induced breeding of *Pangasianodon hypophthalmus*. It can produce viable eggs with high fertility.

Discussion

Catfishes have also been induced bred through similar preparations/drugs. There

Table 2. Induced breeding experiment conducted on *P. hypothalamus* at National Zoological Garden, Dehiwala.

	Number	Weight	Ovaprim 1st dose (ml)	Ovaprim 2nd dose (ml)	Total number of eggs stripped	Total number of fertilized eggs	Fertilization %
Female	No 1	3.20	1.6	1.6	170,000	150,000	88%
	No 2	2.80	1.4	1.4	160,000	140,000	87.5%
	No 3	2.90	1.45	1.45	130,000	100,000	76%
	No 4	3.30	1.65	1.65	140,000	90,000	64%
Male	No 1	3.00	-	1.50			
Total					**600,000**	**480,000**	



Developmental stages of Induced breeding experiment conducted on *P. hypothalamus* at NZG, Dehiwala. (a) Hatchling after 36 of hatching, (b) Fingerling after 2 days, (c) fingerlings after 4 days (d) fingerlings after 15 days.

exists report that the striped catfish has been bred successfully in Mekong Delta region of Vietnam by using high doses of human chorionic gonadotropin (HCG) (Bui et al. 2010). Since the culture of *P. hypothalmus* is profitable among the catfishes, there exists more demand of this species for aquaculture in India and tropical regions of America for sustainable aquaculture (Rahman et al. 2006; Lakra & Singh 2010). Vietnam has already shown the record production (1.0–1.5 million tonne per annum) of this species (Nguyen 2007). Though the Striped Catfish

Table 3. Different feed given to *P. hypothalamus* which hatched after the process.

Date	Average length of hatchling (mm)	Feed	How many times per day
02.03.2015	5	Egg yolk	4 times
04.03.2015	7	Egg yolk, artemia	4 times
06.03.2015	10	Egg yolk, artimea	4 times
08.03.2015	15	Egg yolk, artimea	3 times
15.03.2015	20	Artimea, Grinded meat	3 times
20.03.2015	30	Artimea, Grinded meat	3 times
10.04.2015	50	Grinded meat, commercial fish feed	2 times

is widely cultured in China, Vietnam, Thailand, Taiwan, Philippines, Cambodia, Indonesia, Lao People's Democratic Republic, Bangladesh, Nepal and India (Griffith et al. 2010), this species has been declared "Endangered" in Vietnam due to overexploitation, habitat degradation, changes in flow and water quality as well as over-harvesting of eggs, fry and juveniles for aquarium trade (Vidthayanon & Hogan 2013; Anon 2014). The success achieved in induced spawning and seed (150,000) production of *P. hypothalmus* through ovaprim in the NZG, Sri Lanka will pave the way for mass seed production of this species for conservation aquaculture (True et al. 1996; Anders 1998) which will reduce the pressure on collection of fry and juveniles from the wild natural habitats (Nguyen 2009).

These animals show cannibalism in the nursery tank, which indicates that a low stocking rate of hatchlings and frequent feeding is necessary for the stages. High frequency feeding rate can lead to rapid water quality deterioration that would lead to high mortality rates of the animals. Frequent water changes must be done for the survival of the animals.

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