

## **COMPARISON OF NATURAL AND INDUCED BREEDING BEHAVIOUR AND PARENTAL CARE IN *Channa gachua*, A FRESH WATER FISH**

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### **Abstract**

In natural breeding, Spawners jump frequently above the water and builds nests. Female, only showed aggressive behaviour after spawning. Chasing by male was normal. Both parents guarded the juveniles. In induced breeding spawners never jump. Spawners were sluggish and nest building was observed. Chasing by male was more aggressive. Female guarded the eggs and male guarded the juveniles.

**Keywords :** *Channa gachua*, induced breeding behaviour, parental care

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## Introduction

*Channa gachua*, the fresh water fish, an obligatory air-breather. It naturally breeds during south-west and north-east monsoons in flooded rivers and ponds (Alikunhi, 1957). According to Parameshwaran and Murugesan(1976), induced breeding in such fishes never exhibited parental care but Haniffa (2004) observed the breeding behaviour and parental care in *Channa punctatus*. Present study also observations on breeding behaviour and parental care in *Channa gachua* induced with ovulating agent Ovaprim.

Haniffa (2000) found in induced spawners never jumped as in the striped murrel, *Channa striatus* observed after using pituitary extracts, human choronic gonadotropin and luteinzing hormone releasing hormone analogue and ovaprim. In present investigation, also found that induced spawners never jumped after using ovaprim. Marimuthu and co-workers (2001) observed that induced spawning behaviour and parental care in the induced bred murrels, the aggressive male forces the female to copulate by driving away the passive male, and female guarded the eggs whereas male guarded the juveniles.

The natural Spawners, jump frequently above water and aggressive behaviour was exhibited by female after spawning, Devaraj (1973) found that the chasing by male was normal and selection of male by female was at random.

## Methods and Materials:

The present study was conducted between July and December 2005. Mature healthy males and females were selected by external morphological characteristics (Table 1). Each breeding set consist of two males and one female (Haniffa et al 1996). Ovaprim, the synthetic hormones was used to induce spawning. For this, three doses were used and for each dose, three breeding trials were made to assess the reproductive response of the fish. Injections were administered intramuscularly in the dorso-lateral region of the body. Immediately after administering the hormones, the breeding sets were released into the spawning tanks. For breeding and shelter *Elchhornnis Hydrilla verticillata* and *Vallisneria* and other submerged aquatic vegetation were propagated.

## Results and Discussion:

In the present study, each female paired with a single male. Natural spawners showed frequent jumping above the water surface on the day prior to spawning, no such movement was noticed in the case of induced spawners. Johannessen and

Gjosaeter (1993) found the same result. Induced spawning behaviour was observed 4 h after ovaprim injection until spawning. After spawning, eggs were allowed to hatch and grow along with the parents. At all times the more active and aggressive male paired with the female and the other male was found passive and idle in the corner. Mating was preceded by elaborate courtship. The active male chased the female and frequently excited movement of the paired breeders commenced from 10 to 12 h after the ovaprim injection. In all the spawning attempts, the male was more actively involved in the courtship and spawning. It was seen hitting the female snout and vent region more frequently. The spawning activity continued till the release of gametes. At the culminating courtship, the male bent its body close to the female, breeders joined together and the male released its milt and the female its eggs, after external fertilization occurred. The eggs were laid in a clear area harboured by weeds. Table 2 reports the differences between natural breeding and induced breeding behaviour. Parameshwaran and Murugesan (1976) reported that mating behaviour in *C. punctatus* was preceded by the excited movements of the paired breeders, which commenced about 9-14 h after the second injection of pituitary extract. Similar reports are available on the spawning behaviour of *Anabas testudineus* (Johannessen et al, 1993), *Clarias batrachus* (Moitra et al 1979) and *Heteropneustes fossilis* (Thakur, 1976). In the present investigation, nest building observed under stone-boulder but Haniffa (2004) observed no nest building in *C. punctatus* spawners. The giant murrelet *C. marulius* has been reported to construct a cup-like nest in water not more than 1.2 m depth (Thakur et al 1976).

More over in contrast to previous reports of Parameshwaran and Murugesan (1976), parental care was noticed prior to induce mating. The scattered eggs were pooled in the vicinity of weeds by the moving activity of the male parent. The male parent was found with eggs and hatchlings while the female parent was seen in the vicinity of the egg mass. The fertilized eggs usually float and adhere to each other forming an egg mass 5-10 cm in diameter while the unfertilized eggs lost their adherent ability and were scattered throughout the water. While guarding the egg mass, the male parent remained quiet, curving around eggs or intermittently swimming in a slow circle fanning the eggs with its pectoral fins. Intense parental care was observed in the breeders induced by ovaprim hormones. Both parents guarded the eggs, but aggressive behaviour was observed in the male parent. In *C. punctatus* indicate both parents have been reported to look after the eggs and fry (Alikunhi, 1976) in natural conditions (Haniffa 2004). In the present investigation, parental care was observed up to one month and eggs guarded by the male parent remained clean, developing embryos until hatching and after reaching post-larval stage.

**Table 1 Observation of sexual dimorphic characteristics of *Channa gachua***

Characteristics	Male	Female
Head	Broad blunt head for parental care	Narrow –elongate head
Body colour	Bright	Dull
Genital opening and papilla	Elongated	Oval bulging
Pelvic fin size	Enlarged up to genital opening	Short up to half distance of genital opening
Melanophores	Melanophores on ventral side of body	Not specific

**Table No. 2 Spawning and parental behaviour of *C. gachua***

Induced breeder behaviour	Natural breeder behaviour
1. Spawners never jump 2. Nest building 3. Aggressive behaviour was observed in Male 4. Chasing by male was more aggressive 5. Aggressive male forces the female to copulate by driving away the passive male 6 Female guarded the eggs whereas male guarded the juveniles	1. Spawners jump frequently above water 2. Nest building 3. Aggressive behaviour was exhibited by female after spawning 4. Chasing by male was normal 5. Selection of male by female was at random 6 Both parents guarded the juveniles

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