

## Breeding Biology of Snakehead, *Channa striatus* (Bloch) from District Badin Sindh, Pakistan

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### ABSTRACT

Breeding biology study in *C. striatus* of Badin district described from 80 matured fishes. It was observed that the egg size was found to be increased during July to October (0.70 to 1.30 mm). This resulted the spawning period of *C. striatus* starts from July to October with peak in September. The gonadosomatic index (GSI) values indicated single peak (2.10 and 8.0) during September for both the sexes respectively. Fecundity estimation of *C. striatus* 12 matured specimens was randomly selected. The estimation of fecundity was ranging from 3000-12000 eggs in a fish of 33.4 to 50.8 cm (TL) and 460.5 to 1100.0 g weight. It was noted in the present study that one g of ovary contains 335 eggs and one g of body contains 115 eggs. The values of coefficient of correlation (r) in different parts of the body such as fecundity versus body weight, total length and gonad weight in *C. striatus* found to be closely related with total length than the rest of body parameters.

**Keywords:** Breeding biology, fecundity, gonadosomatic index, *C. striatus*, Badin district

### INTRODUCTION

The snakehead fish *Channa striatus* (Bloch) is an air-breathing fish locally known as Stripe Murrells, Shakur and Sol, is widely distributed in Asian and Africa (Mirza 1982). *Channa striatus* are commercially important along with cultured species of the genus *Channa* in Thailand, Philippines, Vietnams, Bangladesh, Cambodia, India, China, and Malaysia. It is one among the high-priced, freshwater carnivorous, air-breathing, fast growing and hardy hence have a good culture potential. It is cultured in small

ponds, lakes, canal, swamp, marshy areas, small and large rivers and estuarine areas (Mazid *et al* 1987). This fish is suitable for the patients of osteoarthritis and also helpful in wound healing Mathur (1964). Many workers have done work on different aspects of *Channa striatus* but no work has been done on breeding biology of this important fish which is very important scientifically as well as commercially point of view so our work will be helpful for future researcher.

### MATERIALS AND METHODS

For breeding biology gonads were removed from each and every specimen and carefully fixed in Gilson fluid. (Faruq *et al.*, 1998). Fixed gonads then removed from Gilson fixative washed with tap water, the extra moisture was absorbed with the help of blotting paper. The size of each egg was recorded from different regions with the help of ocular. About 100 ova were taken from the different regions of the ovary. The GSI values (gonadosomatic Index) were determined through

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measuring of body weight and total weight of ovary of either sex with the help of electronic balance. The number of eggs in sub-sample of 1.0 g counted, total eggs in 1 g were multiplied by the total ovary weight that resulted as number of ova or fecundity of any fish. In the present study the ova of fish was enumerated through gravimetric method.

## RESULTS

### Breeding Biology Study

#### a) Egg size (ova diameter)

The variations in egg size of *Channa striatus* (Bloch) from district Badin, Sindh, are presented in Table 1. From March to August 2012 the size of egg as observed from the gonads of experimental fish ranging from 0.70 to 1.30 mm. egg size was increased from May to October (0.70 to 1.20 mm). It can be concluded that spawning season of fish *C. striatus* from district Badin starts from May to

October with highest egg size values in the month of September (Table 1).

#### b) Gonadosomatic Index (GSI)

The values of gonadosomatic index (GSI) in experimental fish *Channa striatus* was found to be ranged between 0.20 to 2.10 in male and 4.50 to 8.0 in female with one high during September as indicated in Table 1. It is inferred that *C. striatus* spawns in September as single spawning season, as noted the highest egg size 1.20 mm in September and GSI 2.10 and 8.0 in case of male and female respectively.

#### c) Fecundity

Calculation of fecundity during the course investigations were based on 12 mature individuals of *C. striatus* (Bloch) from Badin district, Sindh is shown Table 2. During the investigations, noted that the estimation of eggs ranged between 3000 - 12000 eggs in *C. striatus*. The highest number of eggs was obtained from an

**Table 1. Monthly changes in egg size and gonadosomatic index (GSI) values in *Channa striatus* (Bloch) from district Badin, Sindh, Pakistan.**

Months	Number of Males	% GSI in Male	Number of Females	% GSI in Female	Ova diameter (mm)
May 2012	08	0.60	10	1.40	0.70
June	10	0.90	08	4.80	0.80
July	10	1.20	08	6.0	1.0
August	08	1.80	10	7.10	1.10
September	08	2.10	08	8.0	1.30
October	10	1.80	10	7.0	1.0

**Table 2. Data on fecundity with different body parameters of *Channa striatus* (Bloch) from district Badin, Sindh, Pakistan**

Total length (cm)	Body weight (g)	Gonad weight (g)	No. of eggs per gram body weight	No. of eggs per gram gonad weight	Fecundity in thousands
33.4	460.5	5.5	113	325	3000
37.1	560.7	6.6	114	330	5700
39.5	690.0	9.5	115	333	6106
40.0	700.0	10.0	115	335	6980
41.7	680.0	9.8	112	329	6615
43.5	815.0	11.1	115	332	8400
47.2	1040.0	13.5	117	335	9720
49.8	1133.5	14.0	117	336	11605
51.2	1190.0	15.1	117	335	11780
52.9	1220.0	15.5	118	336	12000
35.5	480.0	5.9	115	334	4500
36.8	510.4	6.1	115	333	5200

individual of 50.8 cm total length and 1100.0 g body weight (Table 1). While lowest number of eggs was observed from an individual of 33.4 cm total length and 460.5 g body weight. In the present findings it was noted that the mean number of eggs in one gram of body weight was 115 eggs and the one gram of body weight possess 335 eggs. The values of coefficient of correlation (r) in different parts of the body such as fecundity versus body weight, total length and gonad weight in *C. striatus* found to be closely related with total length than the rest of body parameters.

## DISCUSSIONS

In the present investigations the egg size as recorded from the gonads of *C. striatus* from district Badin, Sindh, was ranging from 0.70 to 1.30 mm. The increasing trend in egg size was observed from July to September (0.70 to 1.30 mm). This is in accordance with the observations have been published by number of authors in *C. striatus* such as Kilambi (1986; Ahyauddin 1999; Marimuthu *et al.*, 2007). The GSI values were found to be highest during the months of July to October; ranged between 1.20 to 2.10 and 6.0 to 8.0 in case of male and female. The experimental fish therefore spawned once in year, single spawning season in September. Various authors reported the similar observations in different fishes *C. striatus* such as Kilambi (1996); Ahyauddin (1999); Marimuthu *et al.*, (2007) and Ashwini Ravichandra Jagtap (2013) reported that the GSI values in *C. striatus* from Bangladesh and India ranged between 1.20 to 2.10 mm and 6.0 to 8.0 in case of male and female respectively during spawning months starting from July to October with highest values in the month of September.

The calculation of fecundity in the investigations of *Channa striatus* from district Badin, Sindh was ranging from 3000 - 12000 eggs. The lowest egg count was obtained from an individual fish of 33.4 cm total length and 460.5 g body weight. The highest number of eggs was noted from an individual fish of 52.9 cm total length and 1220.0g body weight. Kilambi (1986) estimated fecundity of *C. striatus* from Sri Lanka 2997 to 11811eggs. Ahyauddin (1999) and Marimuthu *et al.*, (2007) reported fecundity in *C. striatus* ranged between 3050 to 12110 from India and Bangladesh. The above observations as reported by Kilambi (1986), Ahyauddin (1999) and Marimuthu *et al.*, (2007) support the

observations of the present investigations. The values of coefficient of correlation (r) in different parts of the body such as fecundity versus body weight, total length and gonad weight in *C. striatus* found to be closely related with total length than the rest of body parameters. The fecundity versus different body parts was plotted, body length against fecundity in *C. striatus* to be observed closely correlated (0.99). The fecundity found to be directly proportionate with the total length of the fish. Many authors commented that the fecundity possess close dependency with the total length of the fish. Number of reports are available in this regards such as Kilambi (1996; Ahyauddin 1999; Marimuthu *et al.*, 2007; in *Channa striatus*. Findings of the investigation on *C. striatus* from district Badin, Sindh, are similar and in accordance with the results of Ahyauddin (1999); Marimuthu *et al.*, (2007) in *Channa striatus* from Bangladesh.

## CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this paper.

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