J. bio-sci. 14: 99-102, 2006 ISSN 1023-8654

FECUNDITY AND OVARIAN CHARACTERISTICS OF *PUNTIUS GONIONOTUS* (BLOCH/BLEEKER) (CYPRINIDAE: CYPRINIFORMES)

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Abstract

The exotic barb *Puntius gonionotus* was introduced into Bangladesh in 1987. Its faster growth rate, nice taste and compatibility with our culturable species have made it very popular food fish in Bangladesh. With a view to providing some basic information towards development of sustainable seed production of the species, a study was undertaken to determine the fecundity and ovary characteristics of the fish. The mean fecundity of 55 gravid females (of 11 length group) of *Puntius gonionotus* was obtained as 14321 with a range of 2254.67 to 6964.73 from fishes having a mean total length and mean body weight of 200.13±20.58 mm and 196±34.379 g respectively. The relationship between the fecundity (F) and total length (TL), total body weight (TW), ovary length (OL) and ovary weight (OW) were established. Regression analysis was made and the co-efficient of correlation (r) was calculated for each of the following F-TL, F-TW, F-OL and F-OW and the values of r were obtained to be 0.84, 0.84, 0.95 and 0.96 respectively. In all the cases linear relationships obtained were highly significant.

Key words: Fecundity, *Puntius gonionotus*, ovarian characteristics.

Introduction

The Thai Sharpunti, is an indigenous food fish of Thailand where it is locally known as Pla Ta Pian Khao or Thai silver barb. It was introduced into Bangladesh in 1987 to augment fish production through incorporation into our carp polyculture system. Its ability to thrive well in stressed conditions coupled with its faster rate of growth and taste has made it a popular culturable species in Bangladesh. It grows fast at high stocking densities (Karim *et al.* 1988) and feeds mainly on soft aquatic weeds, grasses and algae. It grows to table size within three to four months (Gupta and Rab 1994). It normally breeds in streams and rivers. The spawning season of silver barb is from March to June. Induced breeding and larval rearing techniques are well adopted by the fishfarmers of Bangladesh. A thorough knowledge of fecundity of fish is essential for the management of the fishery (Lagler *et al.* 1956, Doha and Hye 1970). Some others who also worked on the fecundity of fishes include Bhuiyan *et al.* 1995, Bhuiyan and Afroze 1996 etc. Fecundity also determines the index of density dependent factor affecting the population size (Das 1977). The present investigation on the fecundity of *Puntius gonionotus* was carried out to estimate the average and range in the number of ova laid by individual female during the breeding season, as well as to study the relationship of the fecundity (F) with total length (TL), total body weight (TW), ovary length (OL) and ovary weight (OW).

Materials and Methods

For the study of fecundity, 55 (in 11 length group) samples were collected on weekly basis during the period from January 2002 to December 2003. After collection the specimens were sorted out and were preserved in 10% formalin in labelled plastic jars. All these fishes were separated according to sex and the gravid females were recorded for sex ratio and percentage of occurrence.

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The total length and weight of the fishes were recorded to the nearest mm and gram, respectively. After dissection the ovaries were taken out and then moisture was thoroughly wiped out from the ovaries with blotting paper and weighed by a sensitive balance. In the present study gravimetric method was used for the estimation of fecundity. Three samples about 10g each were taken from the anterior, middle and posterior regions of each ovary. The numbers of eggs in each of the sub-samples were counted with the help of a magnifying glass. The average numbers in sub-sample were multiplied by the weight of the ovary, and fecundity was estimated by the following formula:

N= where, N=Total No. of eggs, n=Average Number of eggs in a sub-sample, w=Total weight of ovary, x=Average weight of the sub-sample

Results and Discussion

Description of the ovaries

Ovary of *Puntius gonionotus* was bilobbed with a short oviduct. The two lobes of each ovary were more or less of same size. The shape and size of the ovary were found to depend on the stages of sexual maturity of the female. In the immature and resting stage, ovaries were stripe like and white in colour, but in mature stage it became larger in size and yellowish in colour. The ripe ovaries were found to extend up to the end of the urinogenital pore. The size of the ovam ranged from 0.68 to 0.78 mm with an average of 0.70 ± 0.68 mm in ripe stage.

Fecundity

Fecundity of *P. gonionotus* was found to vary from 1434 in a fish having total length of 159mm and body weight of 45g to 42032 in a fish having total length 210mm and body weight of 159g. It was found that the bigger sized fishes have higher number of fecundity and smaller sized fishes have smaller number of fecundity. Probably nutrition also effect on the fecundity of this fish. Size and age also effect the egg number. The mean fecundity was 6964.73 for the mean total length of 200.13±20.58mm and mean total body weight of 106.19±34.39g. During the estimation of fecundity it was found that *P. gonionotus* spawned once in a year mainly from May to July and March to June in 2002 and 2003 respectively. The fish was moderately fecund.

Fecundity- other parameters relationship

To establish the mathematical relationship of fecundity with other parameters, the values of regression coefficient (b), intercepts (a) correlation coefficient (r) were established by using the statistical formula y=a+bx. Linear correlationships were obtained in all the cases and the coefficient of correlations were highly significant.

Relationship between fecundity (F) and total length (TL)

The mean value of fecundity was obtained to be 22542.67±6969.73 and the mean value of total length was 200.13±20.58 and r=0.84 in the relationship between fecundity and total length (Fig.1)

Relationship between fecundity (F) and total body weight (BW)

The regression equation was found to be linear and the coefficient of correlation (r=0.84) and the relationship were highly significant (Fig. 2).

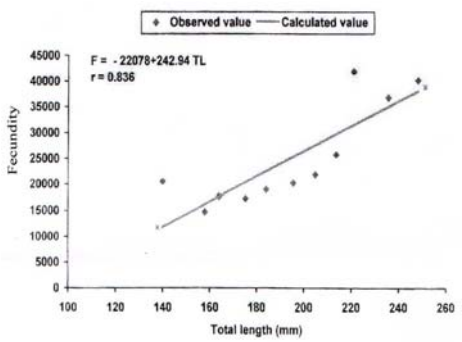

Fig. 1. Relationship between total length and fecundity of *P. gonionotus.*

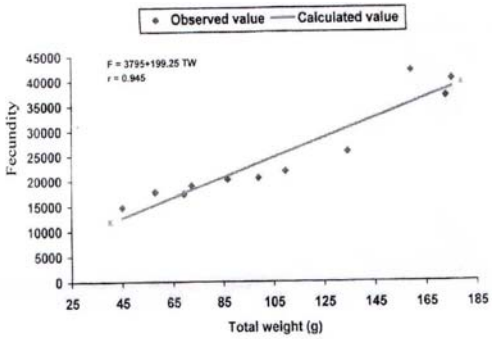

Fig. 2. Relationship between total weight and fecundity of *P. gonionotus.*

Relationship between fecundity (F) and ovary length (OL)

The relationship between fecundity and ovary length was linear and highly significant, r=0.84 (Fig.3).

Relationship between fecundity (F) and ovary weight (OW)

The mean value of ovary weight was 11.39±5.45 g. The relationship between fecundity and ovary weight was highly significant (Fig. 4).

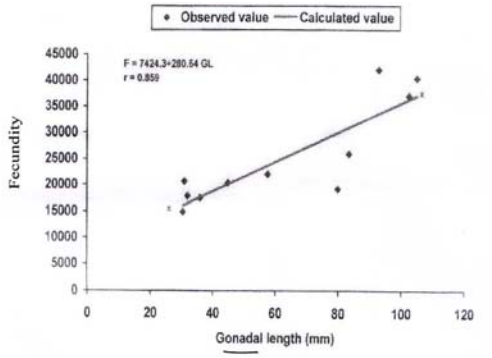

Fig. 3. Relationship between ovary length and fecundity of *P. gonionotus.*

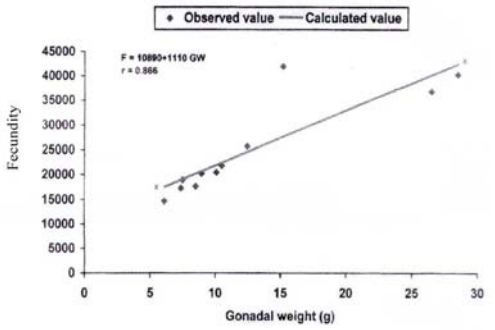

Fig. 4. Relationship between ovary weight and fecundity of *P. gonionotus*

In conclusion it can be said that in *P. gonionotus* the relationships of the fecundity (F) with total length (TL) and total body weight (TW) were linear. The relationships of fecundity with ovary length (OL) and ovary weight (OW) were found to be strongly correlated. *P. gonionotus* is a moderately fecund fish and the numbers of eggs produced were more or less directly proportional to the TL, TW, OL and OW.

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