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THE STUDY OF GONADOSOMATIC INDEX (GSI) AND FECUNDITY OF *ROHTEE OGILBII* (Sykes 1839) FROM NIRA RIVER BHOR, DISTRICT PUNE, (MAHARASHTRA) INDIA.

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ABSTRACT

*Rohtee ogilbii (*Sykes 1839) *is* an indigenous fish from Western Ghats of Maharashtra. The study on Fecundity and Gonadosomatic index (GSI) of *Rohtee ogilbii* sykes, 1839 was undertaken to investigate the reproductive potential of this fish. The mean Gonadosomatic index (%) was 8.079±0.070 with a range of 3.6-11.75. The fecundity was in range of 5382-23542with a mean value of 12964.2±1373.71. The correlation coefficient for Fecundity (Y) and total body weight (X) was 0.9217. The correlation coefficient for Fecundity (Y) and total gonads weight (X) was 0.8477, the correlation coefficient for Fecundity (Y) and total body length(X) 0.8013, and the correlation coefficient for Gonad weight (y) and total body weight (X) was 0.9165. The regression was line was linear when graph was plotted against the fecundity for TL, BW, GW, and GSI. The variable observed were significant at $P<0.01$. This study would help in knowing the commercial potentialities of the stock as well as to impose adequate regulations for the conservation of the edible species and would also benefit the fishery economics.

KEYWORDS: *Rohtee ogilbii* sykes, Gonadosomatic index.

INTRODUCTION

*Rohtee ogilbii (*Sykes 1839) *is* an endemic species from Western Ghats of Maharashtra is been widely consumed by the local population in fresh form as well as dried form. To

understand the gonadal capacity of any fish, gonadosomatic index is the most reliable and scientifically approved indicator because it gives a correct time span regarding season of spawning. On the other hand fecundity is defined as the number of eggs that are likely to be laid during the spawning season (Bagenal 1957).The utility of gonadosomatic index as the indicator of the reproductive acitivity has been discussed. Skasena (1987). Fecundity of any fish is related to egg size, gonad size, and length weight of the female fish. The fecundity among egg laying animals, is the number of eggs being layed for next spawning by the female. Royce (1972). Fecundity is an important parameter to estimate the potentials of egg output by comparing its relation to female size. Chondar (1977). The reproductive potential is an important biological parameter that plays an important role to estimate and evaluate the commercial potentialities of the fish stocks (Gomez-Marquez 2003). The main purpose of carrying out this study on *Rohtee ogilbii* sykes, 1839 *is* to understand and calculate the reproductive potentials, since this fish is widely consumed in fresh as well as dry forms. Hence the study would benefit the commercial aspect and would contribute to the economic aspect of fishery science.

MATERIALS AND METHODS

Freshly collected *Rohtee ogilbii (*Sykes 1839) from Nira River (Bhor) District, Maharashtra), were stored in prewashed polyethylene bags in ice and brought to laboratory on the same day of capture. They were fixed in 5% buffer formalin solution upon arrival in the laboratory. Since there is no sexual dimorphisms is both the sexes, the separation of the female fishes were done based on the bulginess of abdomen, the selected fishes were washed, the excess water from fish was removed with the help of blotting paper. The gonads were kept in 10% formaldehyde for 24 hrs, so as to bring about the hardness of eggs which would help to make accurate and easy calculation. They were weight to the nearest 0.01g. The total length (TL) was measured with the electronic measuring scale to the nearest millimeter. The total body weight and the gonad weight were done on the electronic balance.

Fecundity was calculated by gravimetric method. (Hunter, J.R., B.J. Macewicz and C.A. Kimbrell, 1989). From anterior, middle, and posterior region of the two lobes three cross section were taken. The eggs from each of the three section were manually counted and the mean number of eggs was calculated. From each individual fish the total number of eggs was calculated from the sample mean the total weight of ovaries. (Das, H.P., 1997.) Lagler, K. F., J.E. Bardach and R.R. Miller 1967.)

$$\text{Fecundity} = \frac{\text{Number of ova in the subsample of ovary}}{\text{Weight of the subsample of ovary}} \times \text{weight of ovary in gm.}$$

For calculating gonadosomatic index and fecundity the following formula was used:

$$\text{Gonadosomatic index} = \frac{\text{Weight of ovary}}{\text{Weight of fish}} \times 100.$$

RESULT

The ovary is situated in the body cavity present dorsal to the digestive tract on the either side or air bladder. The ovary is bi-lobed which short oviduct, the shape of the ovary depends on the maturity stage and the amount of ova. The fully extended ovaries reach upto the end of the kidney. The eggs were spherical in shape. To calculate the mathematical relationship between fecundity and other parameters, the values of correlation coefficient (r) was established using the formula:

$$y = bx + a.$$

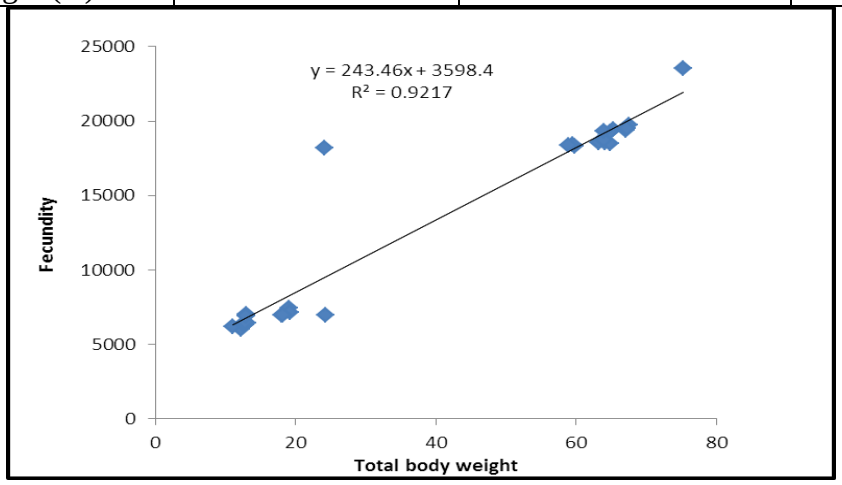
Table 1: mean (± SEM) of various parameters of *R.ogilbii* sykes, 1839 from Nira River, District Bhor. Maharashtra India.

Parameters	Mean ± SEM	Range
Total length (mm)	14.6±0.5305	11.23-75.231
Body weight (gm)	38.46±4.575	11.027-75.231
Gonad weight (gm)	2.783±0.2967	0.431-4.765
Fecundity	12964.2±1373.71	5382-23542
GSI	8.079±0.070	3.6-11.75

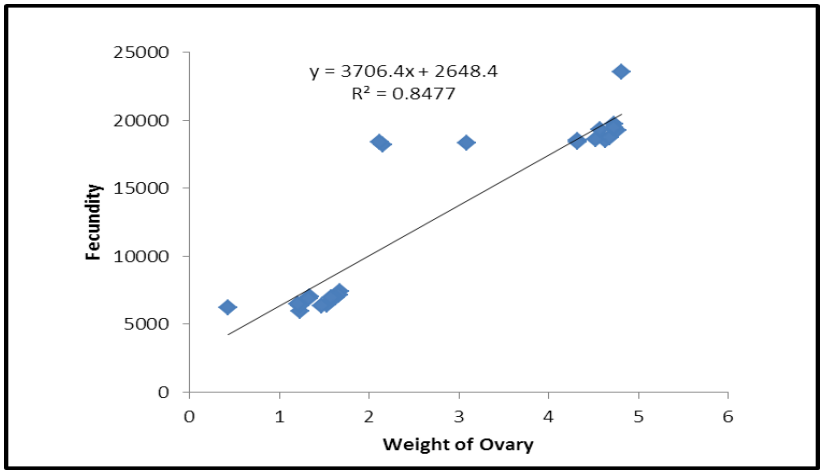
Table 2: shows the correlation coefficient (r) regression equation that was calculated between fecundity and total body weight, total gonads weight, total body length. In all the cases an positive correlatioship were obtained. The regression equation was found to be liner and the coefficient of correlation shows a highly positive relationship.

Relationship	Correlation coefficient (r)	Regression equation	Significance at 1% level
Fecundity (Y) and total body weight (X)	$R^2 = 0.9217$	y = 243.46x + 3598.4	significant
Fecundity (Y) and total gonads weight (X)	$R^2 = 0.8477$	y = 3706.4x + 2648.4	significant
Fecundity (Y) and total body length (X)	$R^2 = 0.8013$	y = 2021.7x - 16681	significant
Gonad weight (y) and	$R^2 = 0.9165$	y = 15.159x - 3.6629	significant

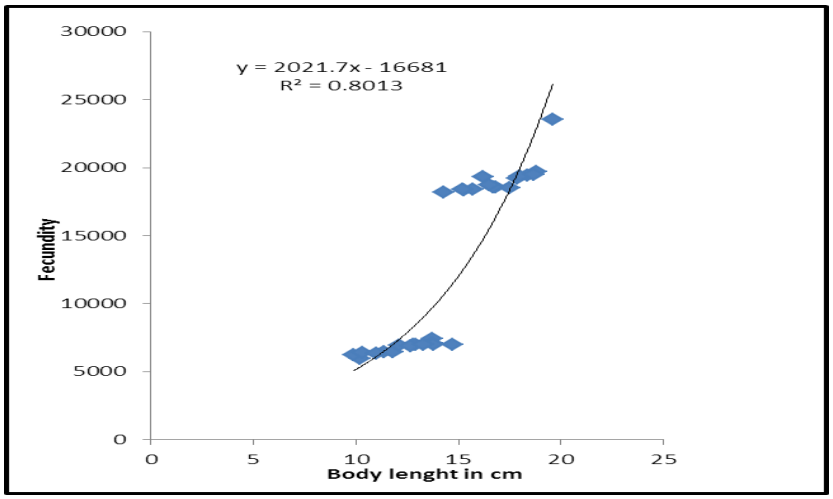
total body weight (X)			



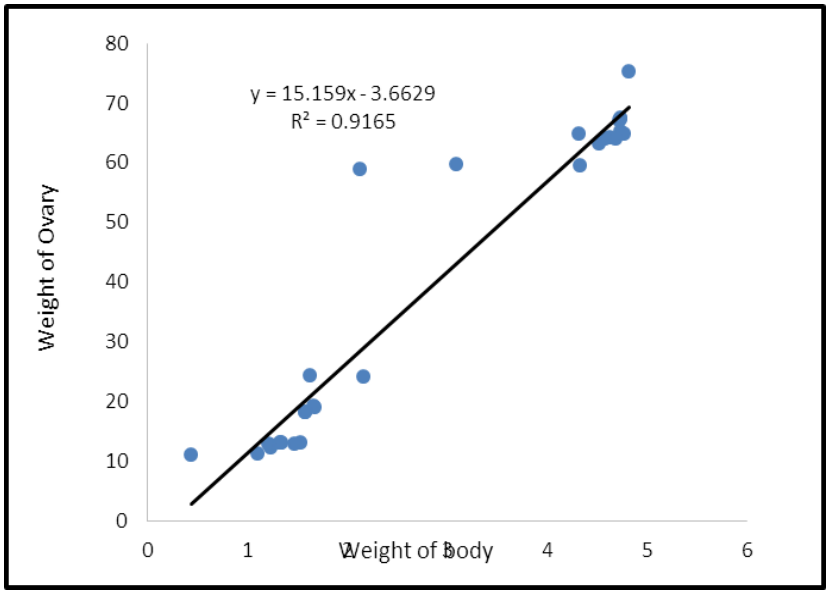
Relationship between fecundity and total body weight of *Rohtee ogilbii* sykes, 1839 from Nira River, District Bhor.



Relationship between fecundity and total weight of ovary of *Rohtee ogilbii* sykes, 1839 from Nira River, District Bhor.



Relationship between fecundity and total body length of *Rohtee ogilbii* sykes, 1839 from Nira River, District Bhor.



Relationship between weight of ovary and total body weight of *Rohtee ogilbii* sykes, 1839 from Nira River, District Bhor.

The relationship between fecundity and total body weight showed a significant positive correlation which is liner r=0.9217. The relationship between fecundity and total gonad weight showed a significant positive correlation which is liner r=0.0.8477. The relationship between fecundity and total body length showed a significant positive correlation which is liner r=0.8013. The relationship between Gonad weight and total body weight showed a significant positive correlation which is liner r=0.9165.

DISCUSSION

In *Rohtee ogilbii (*Sykes 1839) the Gonadosomatic Index was higher during the month of February-March as well as in the month of September-October. This clearly states that the fish spawns twice a year one is the pre monsoon and the second is the post monsoon spawning. It is familiar that the Gonadosomatic Index (GSI) increases with the maturation of fish and decline abruptly thereafter. (Parween, S., N. Begum, M.H. Rahman and M.A. Hossain (1993).The Gonadosomatic index varied from (mean ±SEM) =8.079 ± 0.070 for the range 3.6-11.75. Fecundity in *Rohtee ogilbii* sykes, 1839 varied from (mean ±SEM) =12964.2±1373.71 for range 5382-23542. The study shows that the fish is low fecund. There would be various reason for it including the environmental factor as well as availability of food supply. The variation of fecundity is a common factor and has been reported by many

researchers. (Das, H.P., 1977) (Bhuiyan, A.S., K. Islam and T. Zaman (2006). Nutritional status of the fish is also related to the fecundity. (Gupta, M.V., 1967). Time of sampling and maturation stages can affect the fecundity within the species and between fish population. (Bhuiyan, A.S., K. Islam and T. Zaman (2006).

The relationship between Fecundity (Y) and total gonads weight (X) was found to be linear, significant (r=0.8477) and the equation was Y=3706.4x +2648.4. Fecundity increases with increase in gonadal weight, which is also studied and explained by (Sultan, A., 2010). Positive correlation between fecundity and body weight has been reported (Gupta, M.V., 1967), which supports the present findings. In *Rohtee ogilbii* sykes, 1839 the relationship between fecundity and body weight was significant (r = 0.9217) and found to be liner (y = 3706.4x + 2648.4.

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