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Morphological Study of male *Labeo rohita* with Reference to Condition factor (k) from the River Son, Shahdol (M.P.)

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ABSTRACT:

The condition factor of male *Labeo rohita* fishes in River Son was calculated. Condition factor is used for comparing the condition, fatness, or well-being of fish, based on the assumption that heavier fish of a given length are in better condition. In present study the value of "k" was the minimum (1.7614) in December, while the highest value (3.0921) for this parameter was recorded in August when body weight and GSI also was maximum. The body width was similar to the trend seen with "k".The role of condition factor may be considered as regulatory in reproductive events as it confirms the availability of sufficient food to fish. A number of studies have been carried out in this field confirming role of condition factors in the regulation of fish reproduction. Similar to these findings the present experimental fish *Labeo rohita* also spawn when its condition factor reaches to maximum.

KEY WORDS: Condition factor, *Labeo rohita,* GSI, reproductive events.

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INTRODUCTION

Fisheries management and research often require the use of biometric relationships in order to transform data collected in the field into appropriate indices the empirical relationship between the length and weight of the fish enhances the knowledge of the natural history of commercially important fish species, thus making the conservation possible. Fulton's condition factor (K) is widely used in fisheries and fish biology studies. This factor is calculated from the relationship between the weight of a fish and its length, with the intention of describing the "condition" of that individual fish [7]. Different values in K of a fish indicate the state of sexual maturity, the degree of food sources availability, age and sex of some species [3]. These relationships are also an important component of Fish Base [6.] In addition, the data on length and weight can also provide important clues on climate and environmental changes, and change in human subsistence practices.

Labeo rohita (Rohu) is a major carp and an annual breeder. Based on observations of wild fish, it attains maturity in the end of second year of life [1, 9].However, under pond culture conditions, some fish may mature at the end of first year of life in Indian sub-tropical environment. In Bangladesh, it matures at an age of 3-4 years [9, 12] reported females maturity at the age of 18 month while male attains maturity before the maturation of female in Aligarh, North India.

MATERIALS AND METHODS

Fish Collection and Measurements

Samples of female ***Labeo rohita*** were collected from Son River during different months of year. Sampling started from January 2011 to December 2011.The samples were carefully transported to the laboratory. Water temperature was also measured in situ at the time of sampling by laboratory thermometer.

In laboratory before dissection and removal of gonads total body weight in gram (g), total length and standard length of fishes in centimeter (cm) were recorded. After measurement an incision was made on ventral side of the abdomen and gonads were separated carefully. Immediately the weight and length of gonads also were measured.

Gonosomatic Index

GSI was calculated according to the formula of Lane and Matty (1980).

GSI = g / G x100

Where, g = Weight of gonad, G = Weight of Fish

Condition factor (K)

The coefficient of condition K was calculated using Fulton (1904).

Condition factor (k) = 100,000 W/L^3 mm

Where, W = weight of fish (g), L = Standard length of fish (mm)

RESULT AND DISCUSSION

Environmental parameters

Table-I shows monthly changes in the water temperature during the period of study. The minimum atmospheric temperature of the year is recorded in the month of January (14.5), whereas the maximum temperature (28.5**)** of the year was in the month of May.

Body weight

At the start of the experiment in January the mean body weight was 1430.50g probably because of lower temperature and photoperiod After February, the body weight started increasing gradually and reached 2100.10g in August, the testis were fully developed when water temperature and photoperiod was maximum. After August, it decreased in September (1690.60g) due to spawning.

Total body length and standard length

Minimum total length was recorded in January as 46.6cm and standard length was 38.3 After January the length started increasing and in December it was 53.5 cm and standard length was 43.8 in the last month of present studies.

Condition factor (k) and body width

The value of "k" was the minimum (1.7614) in December, while the highest value (3.0921) for this parameter was recorded in August. The body width was similar to the trend seen with "k"**.**

Gonad weight and length

The weight of testis (14.80g) was the lowest in December, while the highest values (561.95 g) were encountered in August. Although the highest value for gonad length was also seen in August, the minimum values for gonad length were observed in January (10.3 cm).

Gonadosomatic index (GSI)

The GSI values were lowest during the month of January (1.1352), while the maximum were seen in August (26.7582).The monthly distribution of gonad somatic index (GSI) of male *Labeo rohita*

is given in Table I.

In present study the value of "k" was the minimum in December 1.7614, while the highest value for this parameter was recorded in August 3.0921 when body weight and GSI also was maximum. The body width was similar to the trend seen with "k".The role of condition factor may be considered as regulatory in reproductive events as it confirms the availability of sufficient food to fish. A number of studies have been carried out in this field confirming role of condition factors in the regulation of fish reproduction as [11, 3, 2, 7, 14, 10, 8,13]Similar to these findings the present experimental fish *Labeo rohita* also spawn when its condition factor reaches to maximum.

Table-01:-Table showing different morphological data of experimental fish with water temperature during different months of year.

Month	Average Weight of fish (grm)	Average weight of Testis (grm)	Average GSI	Average T.L.(cm)	Average S.L.(cm)	Average C.F.(k)	Average Water Temperature ^{0}C
Jan.	1430.50	16.24	1.1352	46.6	38.3	2.5461	14.5
Feb.	1410.50	25.40	1.8007	46.8	38.6	2.4525	19.0
March	1434.82	45.00	3.1380	47.5	38.7	2.4755	22.5
April	1439.50	55.75	3.8728	47.8	38.9	2.4454	24.0
May	1638.86	94.35	5.7570	47.9	39.8	2.5995	24.5
June	1834.74	194.75	10.6145	49.5	39.8	2.9102	25.5
July	1885.20	434.70	23.0585	50.6	40.5	2.8378	27.5
Aug.	2100.10	561.95	26.7582	52.5	40.8	3.0921	28.5
Sep.	1690.60	271.71	16.0718	51.8	40.9	2.4709	20.5
Oct.	1582.10	198.95	12.5750	52.9	41.7	2.1818	19.5
Nov.	1450.80	15.00	1.0339	53.5	43.9	1.7148	19.0
Dec.	1480.12	14.80	0.9999	53.5	43.8	1.7614	15.0

Fig: 1 Image of Experimental Fish

Fig: 2 Image Showing Testes of Experimental Fish

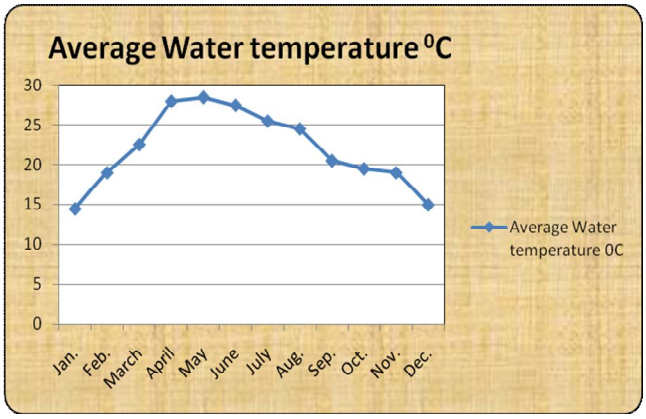

Fig:3 Water Temperature During Different Months of The Year

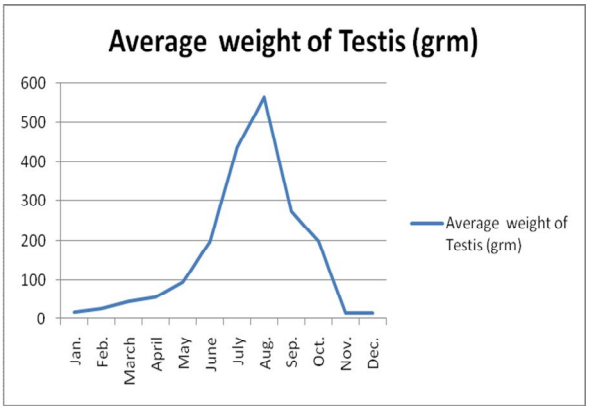

Fig:4 Weight of Testes During Different Months of The Year

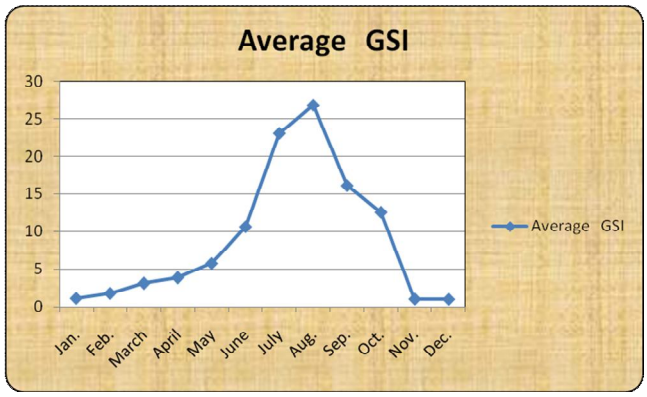

Fig:5 GSI During Different Months of The Year

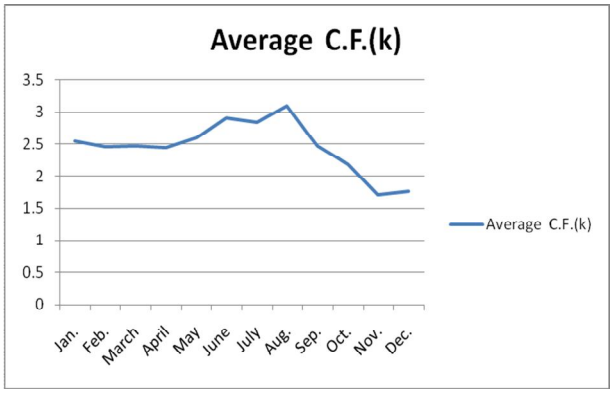

Fig:6 Condition Factor During Different Months of The Year

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