LENGTH-WEIGHT RELATIONSHIP AND RELATIVE CONDITION FACTOR OF *ROHTEE OGILBII (SYKES, 1839)* FROM NIRA RIVER, BHOR. MAHARASHTRA (INDIA).

Nirbhay S. Pimple*[1] and Sanjay S. Kharat[2]

[1]Abasaheb Garware College, Karve road, Pune-4.

[2]Modern College of Arts Commerce and Science, Ganeshkhind. Pune-1

ABSTRACT

Western Ghats of Maharashtra is one of the biodiversity hot spot from India which caters a wide range of flora and fauna. *Rohtee Ogilbii* which is an endemic species from this region and is been widely consumed by the local population in fresh as well as dried form. It is economically important consumed in dry as well as fresh form and it is common in Nira River. logarithmic regression equation obtained for *Rohtee Ogilbii (Sykes, 1939)*. Male is Log W = -0.9501x + 3.5871 Log L and for Female Log W = - 1.0105x + 2.9925 Log L.The regression coefficient obtained in case for Male was R=0.9413 and for the Female it was found out to be R= 0.9167. The result obtained in the present shows a good

relation between length and weight. The cubic law (n= 2.680) in female for isometric growth. In case of male there is slight deviation from the cubic law where (n=3.298). This deviation may be because of early sexual maturity, environmental factor or due to intense feeding. The condition factor Kn obtained for Male is Kn= 0.0250 and for Female it is kn =0.0186. The result indicates that *Rohtee Ogilbii (Sykes 1839)* from Nira River shows well-being in natural habitat and this may be due to less industrialization in the area and less pollutant being added to the river.

Keywords: *Rohtee Ogilbii,* logarithmic regression equation, cubic law, condition factor Kn.

INTRODUCTION

Rohtee Ogilbii (Sykes 1839) belongs to the family Cyprinidae and order Cypriniformes and is endemic to Western Ghat of Maharashtra,(India).The study was undertaken to study the reproductive biology of the fish in its natural habitat. Many work has been done on the L-W

relationship of commercial freshwater fishes from Different water bodies in India.[14,8] The study helps to know the variations from the expected weight, for the known length groups, this in turn reflects its fatness, general well-being, gonad development and suitability of environment of the fish.[10] The length weight relationship in fishes is being carried out to understand the relation between length n weight of a species which forms the basis to measure the growth rate.[2] The length- weight relationship has many practical applications in fishery science especially for commercial fishery so as to understand and calculate the proper management of the population of fish species.[1] The actual relationship between the variables, length and weight may depart from this, either due to environmental conditions or condition of fish.[10]

The physical condition of the fish i.e. the relative fatness of fish is considered generally when we study the condition of fish. This condition or the degree of healthy habitat is expressed by "coefficient of condition," denoted by 'K' (also known as Fulton's condition factor, or length-weight factor, or Ponderal Index). There are many factors responsible for the variation in this degree it may be due to sexual maturity, availability of food, age and even the sex of the individual fish. To reduce the effect on the 'K' value,[10] suggested the calculation of relative condition factor 'Kn' which does so only if the exponent value is equal to 3. K value helps us in understanding the degree of variation, while Kn helps to understand the individual deviation of a fish from the expected weight which is obtained from weight derived from the length-weight relationship. Kn is useful index for monitoring of feeding intensity, age and growth rate in fish.[9]

MATERIAL AND METHODS

From the period ranging from March 2012 to August 2014 fish sample were collected monthly were collected from Nira River. The specimens were wiped with the help of blotting paper after which the measurements were done. Lengths were measured from the tip of the snout upto the caudal fin to the nearest mm. The collected sample was grouped in various class intervals. The weight of the fish was calculated using electronic balance and was calculated to the nearest 0.1gm.

For calculating the length-weight relationship method suggested by[10] was followed.

The length – weight relationship can be expressed as:

$W = a L^b$

Where W and L are weight (g) and length (mm) of the fish respectively and 'a' and 'b' are two constants (initial growth index and regression constants respectively). The values of constant **a** and **b** are determined empirically from data, as the coefficient of condition.[17]

Logarithmically the above equation becomes straight line of the formula:

Log W = log a + b log L,

The constants 'a' represents the point at which the regression line intercepts the y- axis and 'b' the slope of the regression line were estimated by the method of least square.[18]

Condition factor K, a measure of the well-being or plumpness of a fish, was calculated according to the equation presented in[5]:

$K = W \times 10^5 / L^{3.}$

Where W is the weight of the fish in grams and L is the total length of the fish in millimetres. The number 105 is a scaling factor when metric units are used (i.e., grams and millimetres) and is used to bring the value of K near unity.

The relative condition factor, introduced by[10] was calculated using the formula:

Kn = W / w Where, W is the observed weight and w is the calculated weight, and was calculated based on the length- weight relation regression equation as used by.[19] K and Kn was calculated for different month and size wisely for both the sexes.

RESULT

From March 2012- Aug 2014 the study was undertaken, 690 *Rohtee Ogilbii* were sampled month wise, the average length and weight was calculated and was used to plot the relationship. Statistical details of length-weight relationship for male and female on the regression of the log of weight on log of length values for each month has been tabulated in (Table:1) The mathematical relationship between total length and weight of male and female of *Rohtee Ogilbii* obtained by logarithmic regression equations are as follows:

Male : Log W = -0.9501x + 3.5871 Log L

Female : Log W = - 1.0105x + 2.9925 Log L

The graphical expression is shown Fig.1.1 and 1.2

The correlation coefficients (r) for male= 0.9413 (p< 0.001).and for female = 0.9167 (p< 0.001) was found to be significant since (P< 0.001) in both instances indicating good correlation between length and weight.

TABLE 1.

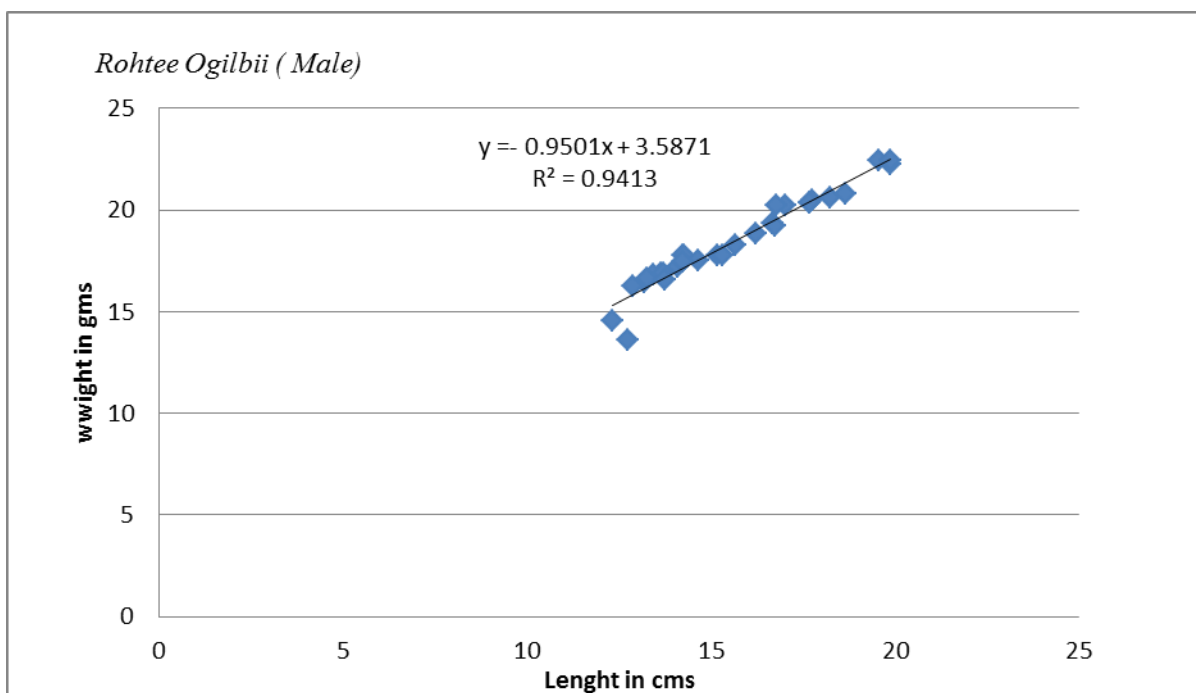| Total Months	Average length in cm (L)	Average Weight in gms (W)	Average (Log L)	Average (Log W)	Average (Log^2)	Average (Log X log W)	Average (Log regression Log W=	Average Antilog of log W(w)	Average Relative Kn= (W/w)	Kn=
30	15.651	11.456	∑ log L=1.901 79246	∑ log W=1 .263 0475 98	∑log L²=1.42 025914	∑log Lxlog W=1.5 063120 32	2.95801 153	1012.45 6	Total=0. 75073 M=0.02 50	m =0.0100 11±0.025 0 kn 0.0250

Fig:1.1 Graphical presentation of length-weight relationship of *Rohtee Ogilbii* (male)

Table: 2

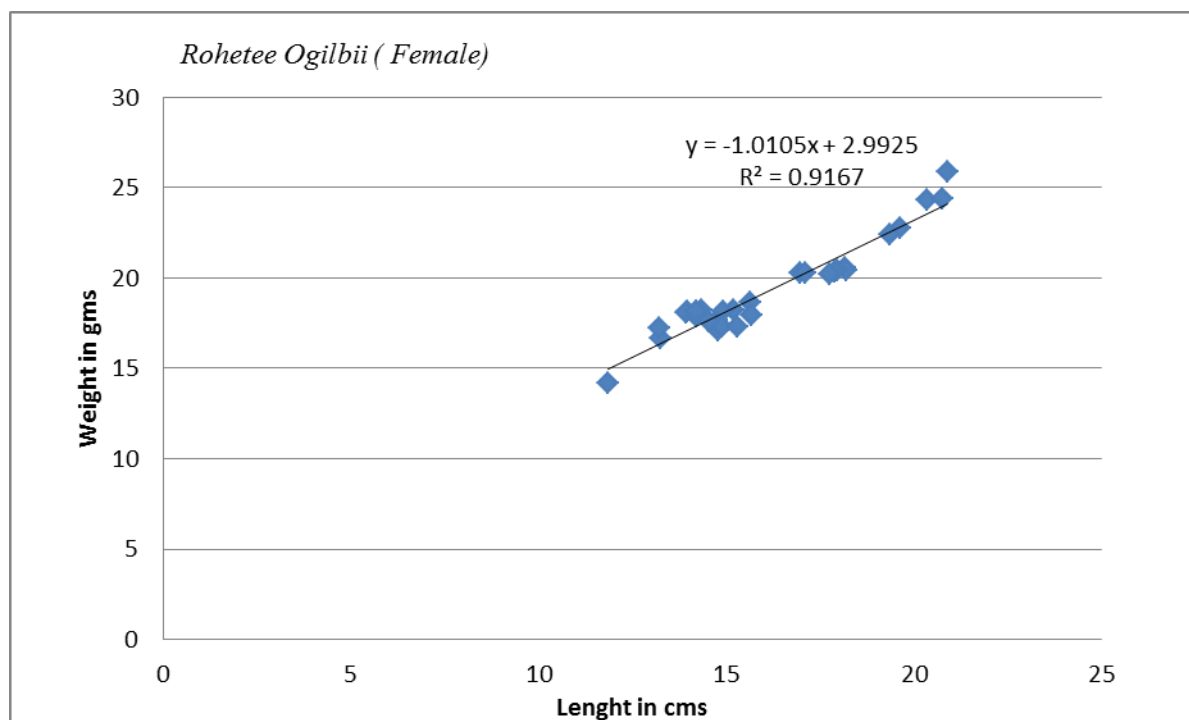| Total Months	Average length in cm (L)	Average Weight in gms (W)	Average (Log L)	Average (Log W)	Average (Log^2)	Average (LogL X log W)	Average (Log regression Log W=	Average Antilog of log W(w)	Average Relative Kn= (W/w)	Kn=
30	16.133	19.2957	∑ log L=1.2 03025 411	∑ log W=1.2 818758 17	∑log L²=1.45 131324 7	∑log LxlogW =1.5454 77232	2.0619325 51	124.018 43	Total=0. 5581219 89mean =0.0186 0	M= 0.01860± 0.0119 kn =0.0119

Fig:1.2 Graphical presentation of length-weight relationship of *Rohtee Ogilbii* (female)

DISCUSSION

Logarithmic regression equation for *Rohtee Ogilbii* Male is Log W= -0.9501x + 3.5871 Log L and for Female it is Log W = - 1.0105x + 2.9925 Log L. The obtained result indicates cubic where n= 2.9925 in female for isometric growth. In case of male n=3.5871. The obtained value shows slight deviation there may be various environmental factors responsible for it. This change may be due to a number of factors Including season, habitat, gonad maturity, sex, diet, stomach fullness, health, preservation techniques and locality,[4,6,20] if the fish retains the same shape and its specific gravity remains unchanged during lifetime, it is growing isometrically and the value of exponent 'b' would be exactly 3.0. A value significantly larger or smaller than 3.0 indicates allometric growth according to[3] the value of 'n' ranges between 1.39 to 4.83. The present results obtained are in agreement with reports of previous findings.[2] The length-weight relationship of fish have significant importance in studying the growth, gonadal development and general well-being of fish population[10, 15,12] and for comparing life history of fish from different localities.[16] The condition factor calculated for *Rohtee Ogilbii* male ranged between m = 0.010011±0.0250. kn= 0.0250, and for female it ranged between M= 0.01860±0.0119 kn =0.0119. There is gradual rise in the conditional factor as the length of the fish increases. A difference in relative condition factor suggests that environmental factor promoting growth may also be contributory.[11] The high Kn value may be due to intense gonad activity during breeding season. The deviation of Kn value may be a onset of maturity and

feeding intensity as observed in Pomfrets.[13] The conclusion can be drawn that feeding intensity, physiological factors like gonadal maturation and spawning along with environmental factors, pollution play an important role in the variations in condition factor *Rohtee Ogilbii.*

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