Length weight relationship and condition factors of *Labeo rohita* from Harsool Dam of Aurangabad Dist. (M.S).

[1]Wagh Jotsna.B, [2]S. A. Quadri, [3]Ovhal S.D, [4]Kharat Pravin, [5]Gaikwad S.B, [6]Varsha Tribhuwan.

[1]Maulana Azad college, Department of zoology, Aurangabad (M.S)-431004 (India).

Abstract: The relationship between length and weight may be varying in different population because of habitat and reproduction activities as well as fishing practices. This research is conducted to assess the length weight relationship because the length weight relationship data is scarce. The value of the correlation coefficient 'r' was 0.9263 * *, the relationship between the length and weight of the fish is essentially calculated according to their growth pattern and age, data on the history of reproduction and the condition factor (K) value for *Labeo rohita* was found very close to 1.00. This demonstrates proper habitat, life cycle and health conditions of fish species in the area. In this study, *Labeo rohita's* length weight relationship increases with the weight. The correlation found to be higher than 0.5 showing the relationship of length weight.

***IndexTerms* - Length, Weight, *Labeo rohita*, conditional factor.**

I. INTRODUCTION

Management and research in fisheries also included the use of biometric relationships to transfer data collected in the field to suitable indices[1]. *Labeo rohita* is one of the main Indian carps and is a geographically wide-spread species in India's tropical freshwater and adjacent countries with significant growth parameters varying[2]. Number of factors affect the relationship between fish length and weight, including seasons, habitat, gonad maturity, sex diet techniques and location[3]. The study of fish's length-weight relationship has a wide application in delineating growth patterns during their development pathways; in measuring fish yields from water masses, etc[4]. Length plays an important role in determining fish age and development, so the study of allometric growth was largely based on the above parameter[5]. In addition, development and the advent of maturity improve the knowledge of the natural history of commercially valuable fish species by improving the scientific relationship between fish length and weight[6]. This relationship can be used to create yield formula, to estimate the number of fish landed and to compare the population over time and space[7]. Growth is typically an improvement in size due to the transformation of the food product into the body's building material through the feeding process[8]. Knowledge of natural history and conservation strategies of commercially important fish species can be improved and regulated effectively by estimating fish length-weight empirical relationship[9]. The LWR can be used as a character to distinguish taxonomic units and to change the relationship with the various developmental events in life, such as metamorphosis, growth and maturity[10].

The present research focuses on the long-weight relationship on one of the commercially important major carp 'Rohu' the knowledge may be helpful for the management, conservation and aquaculture of this species as well as comparing the population of the same species in different water bodies in the same agro-climate zone. The condition variable is a significant biological feature that shows a particular fish's well-being in a body of water. It is an index of the average size of the species and its value depends on physiological characteristics such as maturity; spawning; environmental factor is a mirror for the assessment of fish's well-being in relation to their biotic and abiotic environments[11]. Both the length-weight relationship and the condition factor are important tools for the study of the long-weight relationship, the condition factor[12]. Such morphometric relationships play an important role in fisheries science, as they are used to compare the life and morphological themes of different regions ' populations[13].

II. Material and methods

Samples of fish from the Harsool Dam near the Aurangabad district are collected. The total length of each fish was measured at approximately 0.01 cm and the body weight was registered at the nearest 0.01 g.

The W = aLb regression coefficient may vary from fish to fish from different locations; may vary from different sexes and may or may not be statistically significant[14]. Based on this data, *Labeo Rohita's* length-weight relationship was analyzed for species by applying the formula as suggested by Le Cren, 1951, to calculate the length-weight relationship between length and weight.

W=aLb where,

W=Total weight of fish

L=Total Length of fish

b = is the regression coefficient (slope).

The general parabolic equation W=aLb can be written as log W=log a+b log i.e. Y= A=BX, Where Y=log W, b=n (regression coefficient) and X= Log L this linear equation fitted for the data calculated. After that graphs were plotted for comparison between total lengths against total weight (fig.1).

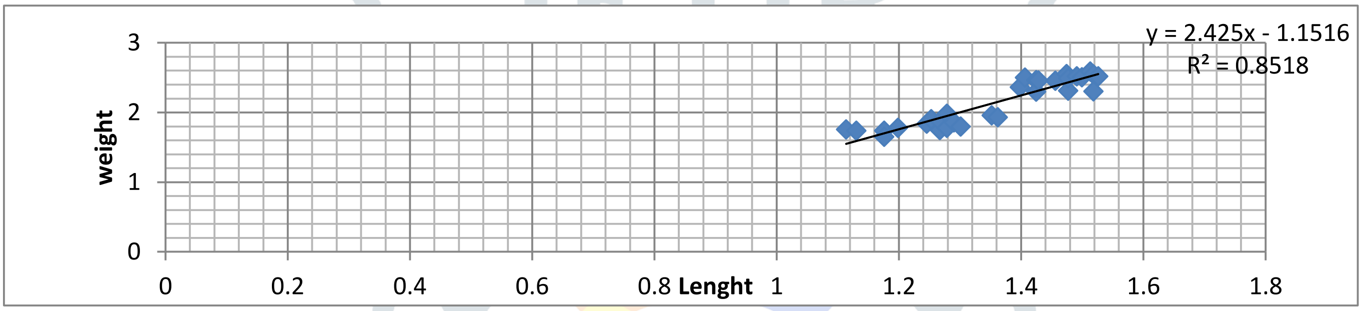
III. **Results and Discussion:** In the present study, the experiment took into consideration a total of 30 samples of *Labeo Rohita*. The exponent b in the LWR should be within the range of 2.5 -3.5 the confidence limit found in this experiment was well within the range and overlapped with the confidence limits of the Bayesian fish base[15]. The length weight relationship in fish is influenced by a number of factors including season, habitat, gonad, maturity, age, diet, nutrition, conservation and annual environmental difference[16]. The relationship of length weight is useful for comparing different species of fish from different water bodies[17]. The results of the analysis of covariance are presented in (Table-1) In the present study, the coefficient of correlation (r) between the length and weight measured and the value obtained from the statistical analysis of the correlation for the species is r=09263 * *, for the Harsool dam species, the correlation found to be higher than 0.5 shows that the length weight relationship is positively correlated and vice versa. The highest correlation in the present study shows that regression values were highly significant, the length weights were calculated as fallows.

IV. W=1.151+2.425 logL (R2 =0.851)

V. (r = 0.9263**).

The length weight relationship of fishes stocked in different tank, value of regression co-efficient b and regression equation is given in fig. 1 In the present study final 'b' is 2.425, Growth is said to be positive allometric when the weight of an organism increase more than (>3) and negative allometric when the weight increase more than weight (b<3)[18], Hence it can be said that the significant correlation exist between body length and weight The intercept 'a' was negative which indicates a perfect linear relationship able to change (a) regression co-efficient obtained in the present study where highly significant (P=0.01)The growth pattern was found to be isometric (b=5.2)in *Labeo Rohita* population in dams (Harsool Dam,) The observation on the length – weight relationship clearly supports the view that straight linear relationship holds good only when the form of the fish and gravity remain constant throughout the active growth period as seen in in *Labeo Rohita* in Harsool Dam[19]. The condition factor 'K' plays an important role in fisheries research and is helpful in providing information regarding water quality, differential growth pattern in various age groups, spawning, relative fatness and well-being of fishes[12]. condition factor (K) value was found very close to 1.00 for *Labeo rohita* showing proper environmental conditions of habitat for this species in Harsool dam[20].

Species from Harsool Dam- Graph and Table- *Labeo rohita*



Sr. no.	Length(cm)	Weight(gm)	r	K (Fultons condition factor)	Kn (Le cren conditinal Factor)
1	10	44.04	0.925389	4.404	0.285068
2	10.5	38.08	0.925389	3.289494	0.24649
3	11.5	44	0.925389	2.893071	0.284809
4	11.6	45	0.925389	2.88296	0.291282
5	13	50	0.925389	2.275831	0.323647
6	13	45	0.925389	2.048248	0.291282
7	14	56.8	0.925389	2.069971	0.367663
8	14.5	57	0.925389	1.869695	0.368958
9	14.7	56.05	0.925389	1.764508	0.362808
10	16	53	0.925389	1.293945	0.343066
11	16.7	60.2	0.925389	1.292549	0.389671
12	16.9	60.3	0.925389	1.249273	0.390318
13	17	67	0.925389	1.363729	0.433687
14	17.5	63	0.925389	1.17551	0.407795
15	17.6	68.9	0.925389	1.263808	0.445985
16	18	70.2	0.925389	1.203704	0.4544
17	20.5	98.3	0.925389	1.141017	0.63629
18	22	100	0.925389	0.939144	0.647294
19	22.3	100.01	0.925389	0.901839	0.647359
20	25	121.21	0.925389	0.775744	0.784585
21	25	318.19	0.925389	2.036416	2.059624

22	25	315	0.925389	2.016	2.038976
23	26.6	284.8	0.925389	1.513196	1.843493
24	28.6	290.8	0.925389	1.243072	1.882331
25	29.8	387	0.925389	1.462387	2.505027
26	30	351	0.925389	1.3	2.272002
27	30	320	0.925389	1.185185	2.07134
28	32.6	340	0.925389	0.981355	2.200799
29	33	354.8	0.925389	0.987283	2.296599
30	34	375	0.925389	0.954101	2.427352

Conclusion: In the present study the length weight relationship of *Labeo rohita* increase with the weight and thereby shows the weight of the fish is a function of length the relationship between length and weight is expressed by hypothetical low W= CLn and the value of 'b' is closely related to 3 as like an ideal fish. The correlation found to be higher than 0.5 showing the length weight relationship

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