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Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol 1, No.4, 2011

www.iiste.org

The Length – Weight Relationship of a Riverine Fish *Chela bacaila (Gunther)*

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Abstract

The length-weight relationship of a fish *Chela bacaila* (Gunther) was studied which was collected from Wainganga river located 20'48º N 79'38º E . The entire length-weight data were analyzed by least squire method. The length-weight relationship of *Chela bacaila* was studied in 386 fishes under three categories as male, female and common. Their corresponding parabolic representations are male *C. bacaila* $W = 0.006634\ L^{2.9086}$, female *C. bacaila* $W = 0.012325\ L^{2.6478}$ and common *C. bacaila* $W = 0.013283\ L^{2.8097}$. The equilibrium constant 'b' is found to be 2.9086 in males, 2.6478 in females and 2.8097 common. The males are heavier than females at equal length. The equilibrium constant not obeys the cube law because it deviates from 3. The value of 'b' found to be less than three hence it indicates the river condition was not found good for healthy development of *Chela bacaila* .

Key word : Length-weight relationship, Chela bacaila, Riverine fish.

1. Introduction

As for as India is concern there is an increase in the population rate as compare to food production rate and due to that there is a problem of protein deficient malnutrition Almost nearly ¾ of our population is suffering from the same problem. The major source of protein rich food is the fish. World's one sixth animal protein comes only from fish. If the fish is used as food for more extent the problem of malnutrition can easily be solved. Hence fishery production becomes the matter of more concern.

For increasing the production of fish in both marine and inland area of water it is essential to explore water resources. Infact the world fish production is about 90% in marine and 10% in inland water. In India this ratio is 60 and 40 percent respectively. To developing the fish industry it becomes very essential to know the biology of fish for satisfactory management. The length – weight relationship is one of the important parameter in biology of fish. According to Le Cren the weight of the fish proportionately increases to the length of fish. If the value of equilibrium constant is 3 it means fish obeys the cube law. But the physical and chemical factor affects the growth and changes the value of equilibrium constant 'b'.

2. Material and Method

The fishes *Chela bacaila* were collected from Wainganga river at Pauni, district Bhandara Maharashtra INDIA located at 20'48º N 79'38º E. The random samples were collected of variable length in 12 months. The fishes were bring to laboratory as for as possible in fresh condition and preserved in 10% formalin The length of fish measure from their tip of the snout to the last ray of the caudal fin in centimeter. After measuring the fish it was weighed on a single pan balance of 0.1gm. sensitivity. The sex of each fish was determined after giving an incision on midventral line. The fishes were categorized in the group of 0.5

centimeters and data obtained was fitted to the formula Y=a+bX in order to test the difference between regression coefficient for male, female and common.

3. Result and Discussion

The length–weight relationship expressed in the equation $W = a L^b$ where as W and L represents weight and length of fish 'a' is the initial growth index and 'b' is the equilibrium constant. In the present study 386 fishes comprising 212 males and 174 females ranging from 8.1cm. to 11.0cm. and weight 8.3 to 10.7 gm. were utilized. The data of length –weight relationship of *Chela bacaila* was categorized in three groups ie. male, female and common.
The general equation $W = a L^b$ can be written as Log W = Log a + b Log L ie. Y = a + bX The linear equation fitted separately and the logarithmic equation of the length-weight relationship in *Chela bacaila* is shown in Table 1. The corresponding form of parabolic equation is shown in Table 2

Hence the cubic formula $W = a L^b$ represent for length – weight relationship for *Chela bacaila* is not proper. The value of 'b' variable from 2.9086 in males, 2.6478 in females and 2.8097 common. These values are not obeys the cube law because values are deviating from 3. The significance of variation for length – weight relationship of *Chela bacaila* was carried out and these are non significant at 5% level.

The length – weight relationship was studied by many workers in variable fishes in India and abroad like Hile 1936 in *Lencicthys artadi*, Allen 1938 in *Salmon trutta*, Bell 1963 in Tuna, Antony Raja 1067 in *Sardinella longicep* , Chatterji 1980 in *Labeo gonius*, Hatikakoti etal. 2004 in *Oreochromis mossambicus*, Das 2004 in *Liza tade*,

In length – weight relationship the growth coefficient 'b' of the fish should be close to 3.0. It may ranges between 2.4 and 4.0 as reported by Dahare, Hile and Martin. The value of 'b' in females is higher than the males as reported by [Dahare, Homiara and Kulshesthra etal. The difference in the 'b' value of male and female indicated that the female were heavier than the males of the same length. In *Chela bacaila* the value of 'b' is 2.9086 in males and 2.6478 in females and common is 2.8097. It means the value of 'b' in males is more than the female . This represents males are heavier than females at equal length. The value of 'b' is found to be less than 3 indicate the fish have no better condition to develop in this river.

4. Acknowledgement

The author thanks to Dr. A. G. Sontakke, Ex. Director Institute of Science Nagpur INDIA for facilities and guidance

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Table 1 Showing Logarithmic equation of *Chela bacaila*

Male *Chela bacaila*	Log Y = -2.1782 + 2.9086 Log X
Female *Chela bacaila*	Log Y = -1.9092 + 2.6478 Log X
Common *Chela bacaila*	Log Y = -1.8767 + 2.8097 Log X

Table 2 Showing the Parabolic equation of *Chela bacaila*

Male *Chela bacaila*	$W = 0.006634\ L^{2.9086}$,
Female *Chela bacaila*	$W = 0.012325\ L^{2.6478}$
Common *Chela bacaila*	$W = 0.013283\ L^{2.8097}$

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