Research Paper

Volume : 4 | Issue : 6 | June 2015 • ISSN No 2277 - 8179

The Study of Well Being of *Trichogaster Fasciata* Bloch and Schneider,1801 During the Pre-Spawning Period in Dhubri District of Assam, India

Zoology

KEYWORDS : LWR, Condition factor, *Trichogaster fasciata.*

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ABSTRACT

The general well being of Trichogaster fasciata is studied in terms of Length – Weight Relationship (LWR) and Condition Factor (K). The LWR is found to be obeying the Cube Law indicating the isometric growth pattern for the studied species. The Regression equation is found to be Log W = -1.780+3.040 Log L. There is high positive correlation (R = 0.951) between the Length and the Weight of the fish species. The Condition Factor (K) is found varying between 1.40 to 2.17 and the mean value is found to be 1.81 ± 0.15. Thus the general well being and the health of Trichogaster fasciata is found to be good in Dhubri district of Assam, India.

Introduction:

Dhubri district (25.5 degree to 26.2 degree North and 89.5 degree to 90.3 degree East) has a vast fishery resources comprising mainly from the downstream of Brahmaputra including its numbers of tributaries and numerous wetlands. There is rich fish diversity in the inland water bodies of Assam including the Dhubri district. *Trichogaster fasciata* Bloch and Schneider, 1801 belonging to the family Belontidae is one of the largely available small indigenous species with great potentials of being an ornamental fish in the present district, the well being of which has been taken to study during the pre-spawning period.

The well being of the fishes can be evaluated with the help of the Length-weight relationship (LWR) and the Condition Factor. Study of length-weight relationship has a significant role in fishery biology and has several applications, since various important biological aspects viz., general well-being, onset of maturity and spawning, fecundity *etc.* can be assessed with the help of condition factor from this relationship (Le Cren, 1951). This relationship was initially used to obtain information on the growth condition of fish and to find out whether the somatic growth was isometric or allometric (Le Cren, 1951; Ricker, 1975). However, the Length-Weight relationship has both applied and basic uses (Pitcher and Hart, 1982). Length-weight relationship of fish varies depending upon the condition of its life in the environment. Very little works were undertaken evaluating the well being of the small indigenous fish species in India. The studies of Chandraika and Balasubramonian (1986); Anna Mercy *et al.* (2008); Manorama & Ramanujam (2011) are worth mentioning.

However, in North-Eastern India, the study relating to the Length-Weight relationship of the small indigenous species of the region is very poor. Therefore, *Trichogaster fasciata* being an important species with food value as well as potent ornamental value (Sheikh and Goswami, 2014) is taken to evaluate its well being in terms of Length-Weight relationship (LWR) and Condition Factor (K) in the district of Dhubri, Assam (North East), India.

Materials and Methods:

This is an analytical study based on the data collected from various fish markets of Dhubri Town and the nearby Gauripur Town. The fish specimens concerning the study were randomly collected during the pre spawning period (in the month of January, February and March, Year 2015) and transported to the laboratory in fresh condition. The lengths and weights of the 90 collected specimens were measured with the help of Vernier Scale and Electronic Balance respectively and recorded accordingly for further mathematical and statistical analysis as follows.

The Length – Weight Relationship is evaluated with the help of Le Cren's equation as follows:

$W = aL^b$

where, W = Weight of the fish in 'gm' ; L = Length of the fish in 'cm' and 'a' and 'b' are the constants.

The logarithmic form of the above equation can be derived into a linear equation as follows:

$\log W = \log a + b \log L$

The entire Log values of the Length and Weight data were pooled into the linear Regression equation with the help of Curve Fit Analysis using the SPSS (Version 16.0) software.

The condition factor or Ponderal index was determined, using the following formula:

$K = W \times 10^2 / L^3$

where, K = Condition factor;

W = weight of the fish;

and L = length of the fish;

Here, the number 102 is a factor to bring the Ponderal index (K) near to the unity (Pauly, 1984 and Wootton, 1992).

Result and Discussion:

From the result of regression analysis as depicted in Table – 1 and Figure - 1, it is found that the Coefficient of Correlation (R = 0.951) which reveals a high correlation between the two variables i.e. the length and the weight.

Table – 1: Model Summary and Parameter Estimates of Curve fit analysis (Length – Weight data of Trichogaster fasciata)

Dependent Variable: Log of W
The independent variable is Log of L.

Equation	Model Summary		Parameter Estimates	
	R	R Square	a	b
Linear	0.951	0.904	-1.780	3.040

Moreover, the regression analysis resulted into the finding of 'a' = -1.780 and 'b' = 3.040. Thus from the value of 'b' = 3.040, it can be said that the fishes are having isometric growth as generally, in fishes the growth pattern follows the cube law. The relationship

for the fishes will be valid when the fish grows isometrically. The intercept 'a' of all the seasonal was negative which indicates a perfect linear relationship between the variables. According to Bagenal & Tesch (1978a) and Goncalves et al. (1997) the 'b' value may change seasonally, and even daily and also between habitats. Therefore, it can be suggested that the length-weight relationship in fish is affected by different factors like age, sex, maturity, temperature, diet and habitats. It is assumed that for an ideal fish the exponent 'b' value is remains constant or in many cases it is found to be very close to 3. Hence, it is generally called the 'cube law'. Again, the cube law (b=3) is not confirmed for all fishes because growth causes for the change of their shape (Ali, 1999). The finding of more than the ideal value suggests that the species is in better condition. Moreover, the correlation coefficient (R) showed a very high degree of correlation between length and weight of *Trichogaster fasciata*.

Following is the mathematical relationship (Linear Equation) generated from the Curve Fit Analysis with the help of which the value of one unknown variable (W) can be calculated from the known value of the other variable (L).

Log W = -1.780+3.040 Log L

And the parabolic equation is found to be $W= -1.780L^{3.040}$

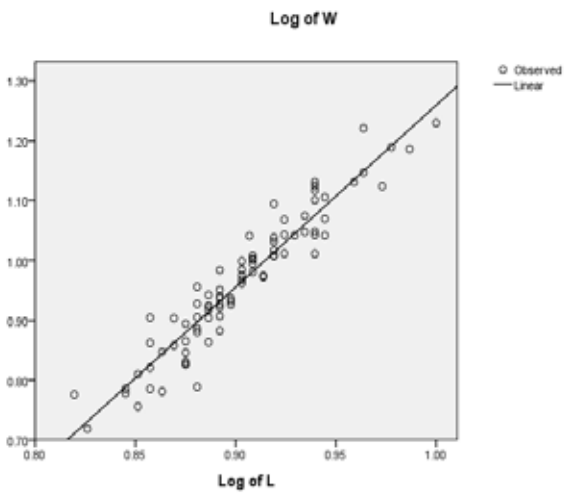

Figure – 1: Scatter diagram showing the Log W and Log L in Length-weight relationship of *Trichogaster fasciata*

The finding is higher than the report of Abujam *et al.* (2012) where they have found b = 2.424 and 2.040 for male and female *Trichogaster fasciata* respectively in Brahmaputra basin of Assam. Moreover, the finding is little poorer than the finding of Bhattacharya and Banik (2012) in Pabo catfish (*Ompok pabo*).

Again as depicted in Table – 2, it has been found that the maximum value of Condition Factor (K) in *Trichogaster fasciata* is 2.17 and the minimum value is 1.40 during the pre spawning period with a mean value of 1.81 ± 0.15. Thus it is more than the unity.

Table 2: Condition factor of Trichogaster fasciata

Condition Factor (K) = W x 10^2 /L^3		
Min.	Max.	Mean ± SD
1.40	2.17	1.81 ± 0.15

The values of the condition factor vary according to seasons and are influenced by environmental conditions, food availability and the gonadal maturity (Jhingran, 1972; Bashirullah, 1975; Braga, 1986). The finding of values of condition factor (K) in between 1.40 – 2.17 indicated that the species were in 'healthy' condition in their natural habitat.

Summary:

The study of well being of *Trichogaster fasciata* in Dhubri district of Assam, India reveals that the species show a good health condition during the pre spawning period. The value of b = 3.040 shows that the Length – Weight Relationship follows the Cube Law signifying the isometric growth pattern of the species. Again the value of Condition Factor (K) being quite more than the unity value reveals good health condition and general well being of the fish species.

Acknowledgement:

The authors are grateful to the Coordinator, Biodiversity and Environment Research Centre (BERC), Department of Zoology, B.N. College, Dhubri, Assam, India for facilitating the study.

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