

## Comparative study on length-weight relationship of *Tilapia sp.* at Rani Talab and Bansagar Colony Pond Rewa (M.P)

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### Abstract

The aim of this study is to record the length-weight relationship for *Tilapia sp.* in Rani Talab and Bansagar Colony Pond. Fish sampling was carried out from the both study sites in all seasons for one year (March 2009 to February 2010). 408 specimens from Rani Talab and 379 specimens from Bansagar Colony Pond were measured and weighed. The value of the exponent  $b$  in the length-weight relationships (LWRs) were 3.0193 and 3.0296. The correlation coefficient 'r' was highly significant between length and weight at the both study sites.

**KEYWORDS:** length-weight relationship, *Tilapia sp.*, Rani Talab and Bansagar Colony Pond.

### Introduction –

In fisheries research length-weight relationships are important for the estimation of weight where only length data are available and as an index of the condition of the fish (Petrakis and Stergiou, 1995; Goncalves *et al.* 1997). It has two objectives (i) to determine the type of mathematical relationship between the two variables. So that if one variable is known the other could be computed and (ii) to know the well-being of fish and growth pattern.

The relationship has been reported by Haimovici and Velasco (2000) and Costa and Araajo (2003) as a very important key which is widely used in the fish biology for several purposes. This useful tool provides valuable information concerning with the structure and function of fish populations (Anderson and Neumann, 1996).

The length-weight relationship of different fishes has been studied by several ichthyologists in several places. *Tilapia sp.* is an exotic fish which had been imported from Bangkok on the Aug. 7<sup>th</sup> 1952 (Pannikar and Tampi 1954). Now a day, it has wide distribution and found in most of the water bodies of this region. Hence the two water bodies were selected to study LWR of *Tilapia sp.* along with other factor.

### Material and Methods –

#### (a) Study sites –

During the present study, two water bodies Rani Talab and Bansagar Colony Pond were selected for collection of fish. During the study period, the data of length and weight were taken March 2009 to Feb. 2010. The data of length and weight of available fishes were collected on monthly basis, using standard method given in literature.

#### (b) Study material –

The length frequency data of combined sex of fresh samples of *Tilapia sp.* were collected from the both water bodies. The total length of the fish was measured to its nearest 0.1 cm. and total body weight was measured to its nearest 0.01g.

**Length-Weight relationship :**A scatter diagram of log body weight against log total length was made for the species. The regression of weight against length was computed from the relationship.

$$W = aL^b$$

Where;

W = Weight,

L = Total Length

a = Constant

b = Exponent, ranging between 2.5 (Hile, 1936).

The log Transformed data gave the regression equation.

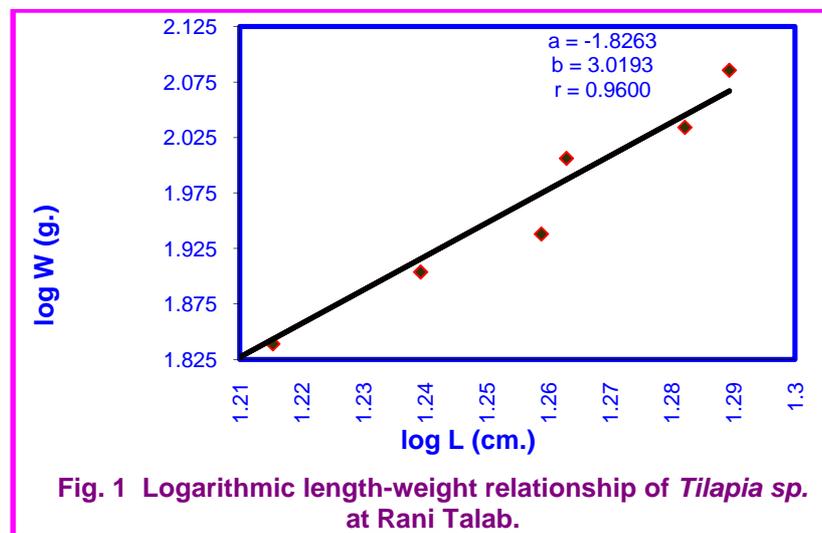
Log W = log a + b log L Where;

a = Constant

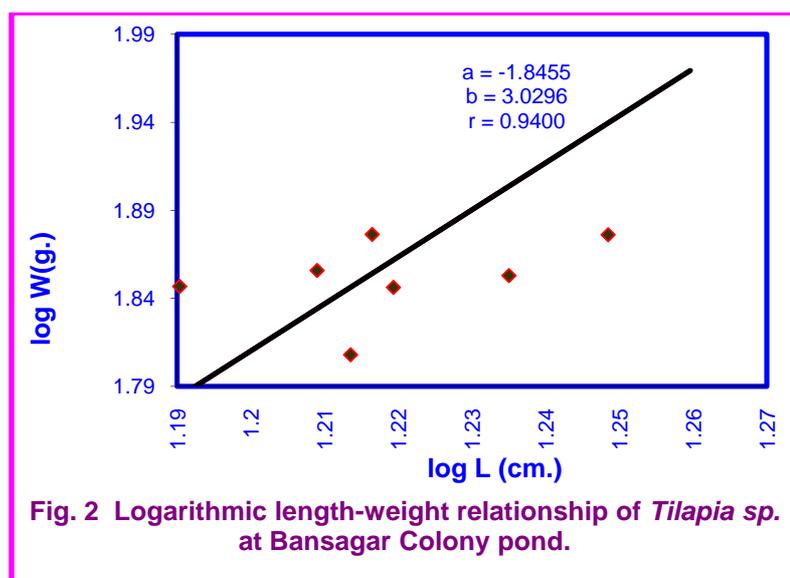
b = the regression co-efficient

### Result and Discussion –

In the case of Rani Talab total 408 fishes were examined for length-weight relationship out of which 103 in summer season, 160 in rainy season and 145 in winter season. During the observation it has found that the value of growth coefficient 'b' was minimum 2.5486 in summer season while it was maximum 3.3208 in winter season. The correlation coefficient 'r' was highly significant between length and weight (Fig. 1).



**Fig. 1** Logarithmic length-weight relationship of *Tilapia sp.* at Rani Talab.



As for as the Bansagar Colony Pond is concern, total 379 fishes were studied out of which 135 in summer season, 110 in rainy season and 134 *Tilapia sp.* in winter season. The minimum 1.7309 and maximum 3.7808 values of 'b' were calculated in bansagar Colony Pond. The maximum value of growth coefficient was found in summer season (Fig. 2).

According to Hile (1936) and Martin (1949) the value of 'b' usually remains constant at 3.0 for an ideal fish. Tesch (1968) reported that value of 'b' might be between 2.0 to 4.0. LeCren (1951) pointed out that the variation in 'b' value is due to environmental factors, season, food availability, sex, life stage and other physiological factors. During the present investigation the value of 'b' showed variation among the season and it was never less 2.5 except during winter season at Bansagar colony pond.

In the present investigation the values of 'b' showed that the rate of increase in body length was not proportional to the rate of increase in body weight. Similar observation were also reported by Dasgupta (1991) and Fafioye and Oluajo (2005) etc. According to Pauly and Gayanilo (1997), b value may range from 2.5 to 3.5, suggesting that present study is valid.

Olurin and Adevibigbe (2006) reported the range of 'b' value from 2.90 to 3.14 which are similar to present study. Konan *et al.* (2007) described length-weight relationship of 57 fish species of the coastal rivers varying the value of exponent 'b' from 2.213 to 3.729 and correlation coefficient 'r' ranged from 0.833 to 0.998. Similar strong positive ( $P < 0.001$ ) correlation coefficient 'r' ranged from 0.95 to 0.99 was found during the present study.

The overall results indicate that *Tilapia sp.* showed an isometric pattern of growth in both water bodies at present habitat. Hence, it can be said that undertaken fishes were followed the cube law.

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