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Full Length Review Article

LENGTH WEIGHT RELATIONSHIP AND CONDITION FACTOR OF Hirundichthys coromandelensis (FLYING FISH) IN BAY OF BENGAL NEAR PULICAT COAST

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ABSTRACT

A study of length-weight relationship of Flying fish from Pulicat was studied for a period of six months (April – September, 2014)May and june is the peak season were recorded . Generally, the frequency distribution of Flying fish from Pulicat was binomial distribution. The length weight regression equation was Log W = 0.977 + 3.16LogL with Correlation coefficient value of 0.850 and significance of correlation values of P< 0.05, _ = 29.2, _ = 199.The "a" and "b" values were 0.977 and 3.16 respectively. The "r" value was positive (1.1). The condition index value range from 0.83 – 1.00 and the condition factor value was 0.94.Flying fish exhibited allometric growth. There was strong association between length and weight of Flying fish. Flying fish was in a good condition.

INTRODUCTION

Flyingfish (Exocoetidae) are common globally in tropical and subtropical waters. They are a significant component of the epipelagic food chain (Parin 1968), and an important fishery resource in Indonesia (Parin 1960, Zerner 1986), the Pacific Islands (Gillet & Ianelli1991), Korea, China and the Sea of Japan (Parin 1960,Shiokawa 1969), southern California, USA (Herald 1969), West Africa (Gibbs 1981), South India (Pajot & Prabhakaradu 1993.In certain parts of tropical Asia, there are locally important artisanal fisheries for flying fish resources (Rao and Basheeruddin 1973; Pajot 1991; Pajot and Prabhakaradu 1993.Seasonal fluctuations in the fisheries of flying fish are evident, which are believed to be attributed to oceanographic factors (Jinadasa 1985; Jayawardana and Dayaratne 1998). Aggregation of pelagic schooling fish is known to be influenced by light intensity associated with lunar phase (Karunasinghe and Wijeyaratne 1996; Freon and Misund 1999).

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The length-weight relationship is useful for the prediction of weight from length values, condition of fish, stock assessment, and estimation of biomass (Petrakis and Stergiou, 1995; Vaslet *et al*., 2007). These factors are applicable in population dynamics and aquatics ecology science (Pauly, 1993; Santos *et al*., 2002) also data of length-weight are useful for fishery biologists for monitoring the state of health of a population (Cone, 1989; Ecoutin *et al*., 2005). The length-weight relationship parameters (a and b) of economically important fish species like Hirundichthys coromandelensis (flying fish) from Bay of Bengal (East Coast) near Pulicat. This is the first study to report these parameters in pulicat by gill net fishing in bay of Bengal waters. These parameters are important in stock assessment studies.

MATERIALS AND METHODS

STUDU AREA

The Pulicat Lake is situated between 13°25' and 13°55' North, and 80°3' and 80°19' East. The lake is about 45 km north of Chennai and can be reached by bus from Chennai. Pulicat Lake has been a traditional fishing centre. This was a trading port for

the Portugese and Dutch in the 16th and 17th centuries. The process of soil erosion and siltation is believed to have started with the Dutch over-exploiting the mangroves for commerce and trade.

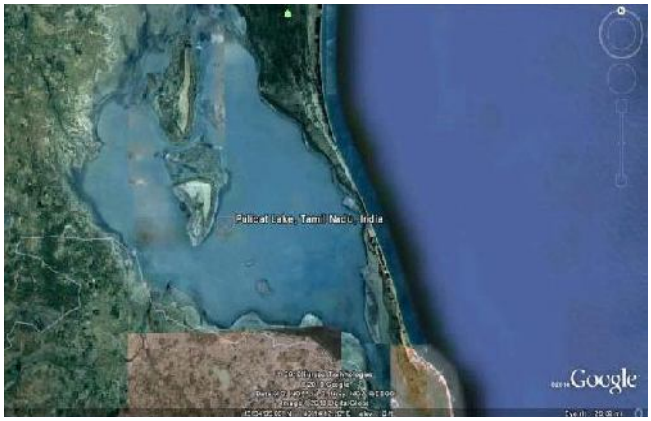

Fig. 1. shows the Pulicat Lake.Source : Google Earth

Comparison between obtained values of t-test and the respective tabled critical values give the determination of the *b* values statistically significant, and their inclusion in the isometric range (*b*=3) or allometric range (negative allometric; *b*<3 or positive allometric; *b*>3).

The condition factor of the experimental fish was estimated from the relationship

K= 100/L3

Where:
K = Condition factor
W = Weight of fish
L = Length of fish (cm)

RESULTS

The Length and frequency distribution of *Hirundichthys coromandelensis* from Pulicat was showed in in Table 1. The regression analysis values are presented in Table 2.and the condition factor of *Hirundichthys coromandelensis* is presented in Table 3.

Table 1. Length weight relationships of *Hirundichthys coromandelensis* from Pulicat

S.no	Fish species	No	Length-Weight Relationship	Correlation Coefficient	Significance of correlation
1	*Hirundichthys oromandelensis*	200	Log W = 0.977 + 3.16LogL	0.850	P< 0.05, _ = 29.2, _ = 199

Table 2. Regression analysis values of *Hirundichthys coromandelensis* from Pulicat

S.NO	SPECIES	a-VALUE	b-VALUE	r-VALUE
1	*Hirundichthys coromandelensis*	0.977	3.16	1.1

Table 3. The condition factors of *Hirundichthys coromandelensis* from Pulicat

S.No	Condition Index Value	Condition Factor
1	0.83 - 1.00	0.94

SAMPLE COLLECTION

The study area extends from Northern part of Tamilnaudu coast (Pulicat) and Southern part of Andhra Pradesh for Hirundichthys coromandelensis in different month in the Bay of Bengal. Samples were collected during the period of April to September 2014 of fishing research surveys using the FRP Motorised Boat .The specimens were caught by gill nets it contain more floaters and less shrinkers and all the fish length (total length) and weight were measured by using the scale and weigh balance respectively.

DATA ANALYSIS

The relation between the weight and the length of samples was computed by equation:

$W = a\ Lb$

Where *W* is the total weight in grams, the exponent.

The parameters logarithms: *Log (W) = log (a) + b log (L)* standard error *r2* (the coefficient of determination) also were calculated.

DISCUSSIONS

The maximum size attained by *H.coromandelensis* in this study varied with those of other reported. It had however been shown that the maximum size attainable in fishes generally is location specific. Sampling season is very important and determines the size of fish caught. Another reason for the variation of fish size may either be genetic or environmental. The length exponent "b" = 3.17 *H. coromandelensis* showed growth was allometric based on Bagenal and Tesch (1978) with the criteria of "b" = 3. The length weight relationship is cuvililinear with the exponent ranging from 2.5 to 4.0. Growth is isometric when the length exponent is less than or equal to 3 and allometric when length exponent is greater than 3. Values of Length exponent in the length weight relationship of the fish studied increased in weight faster than the cube of its total length. The high correlation coefficient "r" =1.1 obtained in this study showed that there was strong association between length and weight. This means that as the length of the fish increases, the weight also increases in the same proportion. High correlation coefficient "b" values have also been reported by different author in various fish species from different water bodies. The correlation coefficient "r" values were positive for *H. coromandelensi*. This means that there was a positive correlation between length and weight of *H. coromandelensis*

from Amassoma flood plain.The condition factor value "k" = 0.94 estimated in this study compared favourably with other reports from similar studies in similar water bodies. Condition factors of different species of cichlid fishes have been reported. Condition factors reported for some other species include: Alfred – Ockiya (2000) for Chana chana in fresh water swamps of Niger Delta and Hart (1997) for *Mugil cephalus* in Bonny estuary.From a sample size of 81 specimens, K value was 0.999 and the exponential equation was Wt == 0.05998 (TL), indicating an isometric growth pattern.

There was no temporal variation in the condition of the fish with condition index value 0.83- 1.00 and condition factor value of 0.94 is an indication of the fish species good condition.Although no study was carried out on the physical and chemical parameter to confirm this, Bagenal and Tesch (1978) reported that if the condition factor "k"≥ 0.5, the fish is in a good condition. This indicated no significant difference (Mann-Whitney test: Z = 0.016, n = 52, p = 0.987). This indicates that observer V's starboard observations were by chance during periods of high flyingfish abundance.

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