

## **Carapace Width -Weight Relationship Of Mud Crab *Scylla Serrata* (Forsk, 1775) Collected From Pulicat Lake, Tamilnadu, India**

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### ABSTRACT

*Mud crab Scylla serrata form an important fishery in the Pulicat lake, Tamilnadu. In the present study the relationship between carapace width and body weight were estimated as (Log W= -0.342438+2.914702). The estimated 'a' and 'b' value for carapace width and body weight were -0.342438 and 2.914702, respectively. The result showed an isometric growth pattern and significant differences were found between carapace width and body weight in the mud crab collected from Pulicat lake, Tamil Nadu, India.*

**Key words:** Mud crab, Length-weight relationship, Scylla sp.

### Introduction

In crustaceans, as growth progresses certain dimension of the animal's body may grow much more than others, resulting in the phenomenon known as relative growth (Hartnoll, 1974). Studies on relative growth are used to determine changes in the form and size of the abdomen, pleopods or chelipeds during ontogeny. Knowledge of these distinguishing characters and size relationships in sexually mature individuals is of particular importance in the study of commercially valuable crustaceans. Such knowledge can be useful for further studies on the life history of the species and in the development of its fishery, resource management and culture.

Study of width-weight relationship in aquatic animals has wide application in delineating the growth patterns during their developmental pathways (Bagenal, 1978). The width/weight relationships are regarded as more suitable for evaluating crustacean populations (Atar & Sector, 2003; Gorce et al., 2006, Sangun et al., 2009). Estimates on the relationships are useful to know the variations in expected weight from the known length groups which are in turn the indication of fatness, breeding and feeding states. However, information available on the mud crab is mostly restricted to *Scylla serrata* (Nandi et al., 1996, Sukumaran & Neelakantan, 1997). For the present paper, Carapace width- weight relationships of the mudcrab were estimated.

### Materials and Methods

For the study, the samples of *Scylla serrata* were collected from the Pulicat Lake, the second largest brackish water lake or lagoon in India. Relationship of carapace width and weight were analyzed. Crabs in the intermoult stage with all appendages intact were considered for the study. All materials were analysed in fresh condition. Carapace width (CW) between tips of the longest lateral spines across the middle line between the frontal notch and posterior margin was measured. Individual crab weight was taken in a weighing balance.

The carapace width-weight relationship was estimated using the log form of the allometric growth equation  $W=aL^b$  (Rickter, 1973), where W=expected weight, L=total carapace width, a= 'y'-intercept or the initial growth co-efficient and b= the slope or growth co-efficient. The values of constants of 'a' & 'b' were calculated by the least square method. The differences in the carapace width-weight relationship between sexes were tested by ANOVA.

### Results and Discussion

A Scatter diagram (Fig 1) was obtained by plotting the width against weight of individual crabs. From the closeness of the scatter and the Parabolic nature of the plot a good relationship was found between width and weight as also the suitability of fitting the exponential formula  $W=aL^b$  to the data. The logarithmic equations derived is  $\text{Log } W=-0.342438+2.914702$ .

The coefficient of correlation (r) obtained for the carapace width and weight of the mud crab is 0.97 (nearly equal to 1), indicating that the values were significant. Hence, a high degree of positive correlation was evident between width and weight. The exponential value of the width-weight relationship was 2.914702, thereby indications nearly an isometric pattern of growth.

However for an ideal organism which maintains its shape throughout the value of 'b' will be '3' (Allen, 1938). But in a number of organisms the value of 'b' lies between 2.5 and 4.0 (Martin, 1949). The present findings are in accordance with those of Sukumaran and Neelakantan (1997) in *Portunus pelagicus*. Cheewasedtham reported that the relationship between Carapace Width and Weight was  $\text{Log } W = -0.00033 + 2.92$  in *Scylla serrata*. The relationship between carapace width and weight was  $\text{Log } W = -0.147 + 2.567$  in *Sudanonautes africanus* were reported by Bello-Olusoji et al., (2009). The values of b ranged from 2.04 to 3.24 for *Callinectes sapidus* (Stickney, 1972). Growth was isometric (3.04) value in the length-weight relationship study of portunid crab, *Callinectes pallidus* (Bello-Olusoji et al., 2006). Change of 'b' values depends primarily on the shape and fatness of the species. Various factors may be responsible for the difference in parameters of width-weight relationships among seasons and years, such as temperature, salinity, sex and maturity stage. The Carapace Width and Weight relationship showed that *Scylla serrata* is a good candidate species for aquaculture. It is also essential for proper assessment and management of resources in the Pulicat lake.

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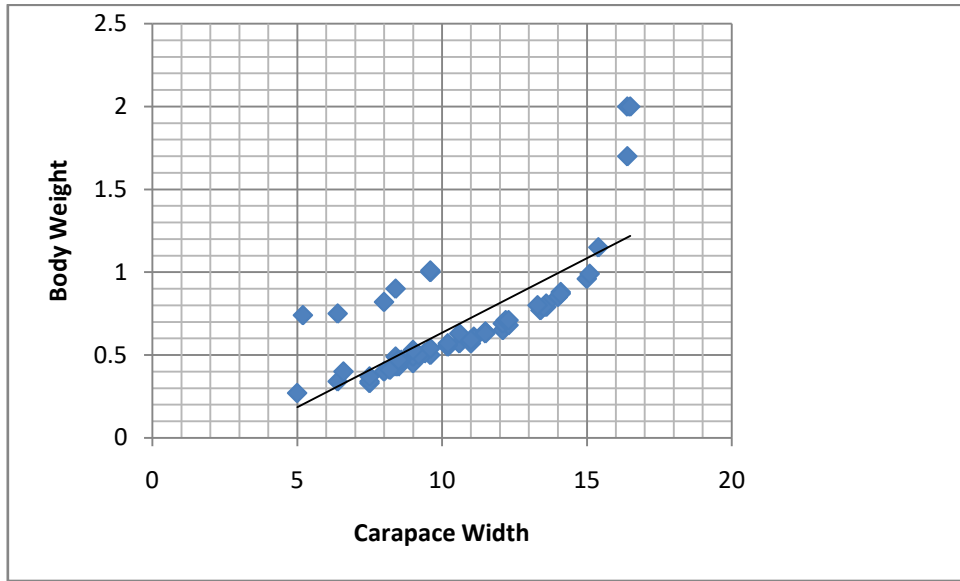
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(Figures & Tables)



**Fig 1:** Logarithmic relationship between carapace width and body weight of *Scylla serrata* collected from Pulicat lake.