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Length-weight relationship and condition factor of freshwater crab *Barytelphusa gurini*, (Decapoda, Brachyura).

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Abstract
The length-weight relationship and condition factor of *Barytelphusagurini* was studies. The exponent 'b', value for males 2.83 and for females it is2.03, and combined crabs is 2.35. Growth generally shows negative allometry in all crabs. The condition factor (K) for male is 0.000802, for female is 0.000669 and for combined sexes is 0.000214. The regression revealed high correlation andthe coefficient of determination (r^2) for male is 97.8%, in female it is 98.6%, which is very close to 1, and in combined crabs it is 93.7%.

Keywords: Length-weight relationship, *B. gurini*, Condition factor (K).

INTRODUCTION

The studies of Length-weight relationship provide practical assessment of stocks aquatic species (Gulland, 1983 [8]; Enin. 1994 [6]; Stergou and Moutopuios, 2001 [15], Pauly (1993) gives the following situations when length-weight relationship may be required. (1) The conversion of length of individual fish to weight. (2) Conversion of growth equation for length into growth equation for weight, and (3) comparisons between populations of the same species or between species. Gonad development, rate of feeding, metamorphosis, maturity and well being of the animal population, in such type of studies length-weight relationship is very useful, (Le-Cren E.D, 1951[11], Bolger and Connolly, 1989 [4].

Length-weight relationship (LWR) can be determined by using the equation, $W= aL^b$, which was fitted in regression model. Where, 'b' is constant of (LWR), and has values between 2 and 5 (Begenal and Tesch, 1978 [3]), reported when, (b=3) isometric growth take place (animal grows without changing body shape), but when b value are below or above 3 allometry growth takes place (animal changes its shape as it grows larger).Several studies have been carried out in this regard for finfish species and crustaceans. The reports of Stickney, 1972 [16], on fishes and invertebrates in Georgia costal water, Georgia,Olmi and Bishop, 1983 [12], on the blue crab *Callincetessapidus*, Rathbun from the Aishly river, south Carolina; Prasad, et, al., (1989) [14] on three Portunib crab species.

Freshwater crab *Barytelphusagurini* is an edible crab with high commercial and nutritive value, as it is distributed throughout the India.The study of length - weight relationship of fresh water crab received little attention in Indian continent. The objective of this study was to obtained condition factor and length-weight relationship of freshwater crab*B. gurini*.

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MATERIAL AND METHODS

Crabs use in this study were bringing monthly by animal supplier from Kham River, near Aurangabad region on April2010 to December2010. Live crab was placed in the aquarium in the laboratory. Animals were identified and separated according to sex. A total 198 individuals were given to this study, body dimensions were measured by using vernier caliper while body weight measured using Electronic balance. The measurements included the carapace length (CL) and W is weight of the body of crab.The length-width relationship is calculated by using the formula, $W=aL^b$ (Bagenal and Tesch, 1978[3]). Where W, is body weight of crab in (gm), and L, is Carapace length (mm). 'a' and 'b' are constant, 'a' is intercept and 'b' is slope of equation or known as growth constant. The equation is represented in log transformation,

Log W = Log a+ Log bL (Lagler, 1968).

Fulton's condition factor K was calculated by the formula, $K=100W/L^3$, (Gayanilo *et al*., 1997 [7]). Where, K=condition factor, W= mean weight of crab (gm), L= mean length of crab (mm). The strength of Length-weight relationship is determined by coefficient of determination (r^2) and slope value (b =3) is tasted by student t- test at (p=0.05) level of significance.

RESULTS

After doing calculation results are obtained for length-weight relationship (LWR) of freshwater crab *B. gurini*. The exponent 'b' value of male crabs is 2.83 and 'b' value for females crab is 2.03, and for combined crabs it is 2.35. Growth generally showed negative allometry growth in all crabs. The scatter diagrams for the length-weight relationship for male, females and combined crabs are illustrated in fig1,2 and 3. Generally, the regression equations revealed high correlation, in all sexes. The coefficient of determination is r^2= 97.8% in males and 98.6% in females and 93.7% in combined animals. The student t-values for (b=3) for males is 6.92, for females is 8.83, and for combined crabs is 11.5 at (p-value 0.05), these are significant at 5 % level of significance. The Condition factor (K) for the males is 0.000802 and for females are

0.000669 and for combined crabs is 0.000214, which is greater in male than in females.

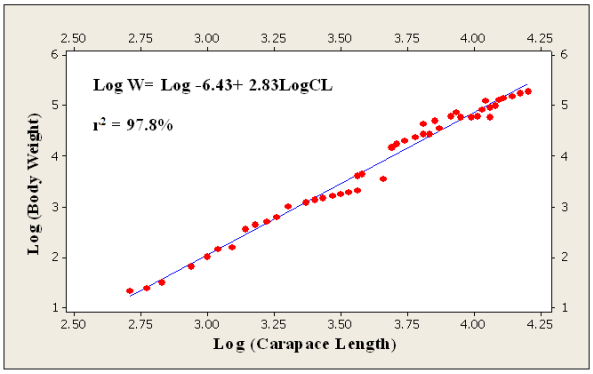

Fig 1. Length-Weight relationship of male crab *B. gurini,* (N= 100).

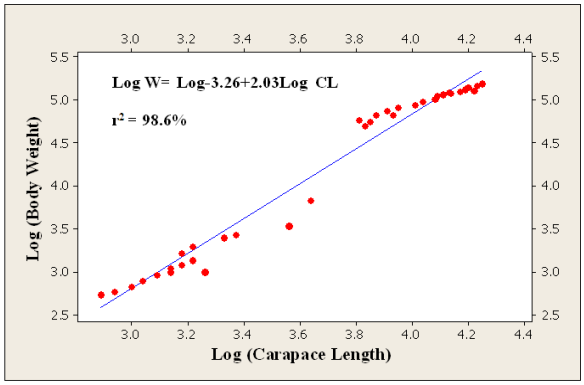

Fig 2. Length-Weight relationship of female crab *B. gurini*, (N=98).

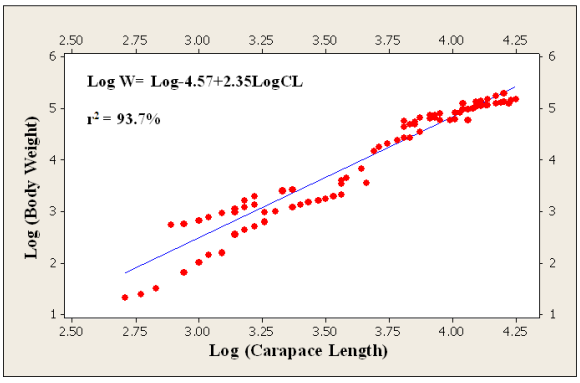

Fig 3. Length-Weight relationship of Combined crab *B. gurini,* (N=198).

DISCUSSION

The LWR in *B. gurini* showed the observed values of the regression coefficient 'b' for males is 2.83, for females it is 2.03, and combined crabs is 2.35. The obtained values are less than 3 are the indicated negative allometric growth as given by (Begenal and Tesch, 1978[3]). These resultsare agreed with the result from Badagry, Lagos and Lekki lagoons for the same species by (Lawal-Are, 2003[10]). It is also same with the results obtained for *C. sapidus* from Georgia (Stickney, 1972 [16]) and Beymelek Lagoon Lake, Turkey (Atar and Secer, 2003 [2]), and the result on *Callinectes amicola,* by (Abowei and George, 2009), from Okpoka creck, Niger Delta, Nigeria. The observed values of 'b',of crab *B. gurini* are different from obtained result for Lagos Lagoon and it adjacent creecks on the same species by Emmanuel 2008 [5], showed positive allometry growth for *C. amnico la*.Akin-Oriola [1] for Callinectespallidus from OjoCreck in Badgry Lagos state.Wootton (1992) provides a rough idea on this situation, indicating that allometry growth is negative (b<3) if the fish gets relatively thinner as it grows larger, and positive (b>3) if it gets plumber as it grows larger. In the particular cases, *Barytelphusa gurini* as (b<3) and it, shows negative allometry growth, indicating that it gets relative thinner as it grows larger.

The regression lines revealed a high correlation in all sexes and the coefficient of determination (r2) is 97.8% in males, 98.6% in females, and 93.7% in combined crabs, all these values are very near to unity. It indicated very high positive correlation between carapace length and total weight in this species. This agreed with the report on the same species from Badagry, Lagos and Lekki Lagoons by (Lawal-Are, 2003[10]) and the result on the species from Lagos Lagoon and adjacent Creeks by Emmanuel 2008[5]. Similar trend was also observed on two *Macrobrachium macrobrachion* by (Enin, 1994[6]) in the Cross River Estuary of Niger Delta, and the result on Callinectesamicola, by (Abowei and George, 2009), from Okpokacreck, Niger Delta, Nigeria. The differences in results of the exponent 'b' may be possible due to various reasons like difference in their diet, which resulting size difference, change in cheliped strength, foraging behavior and metabolic rate of species and environmental changes also effects.

The condition factor in *B. gurini* is different in males and females. The condition factor is higher in males than females.This results show similar results like,Lawal-are and Kusemiju, (2000) [9] reported higher condition factor in male than female's crabs in Badagry Lagoon Nigeria. Also while Emmanuel 2008 [5] in *Calinectesamnicola* observed in his study at Lages-Lagoon and its adjacent creek higher condition factor in the males than the females crabs. However these results are contrary with the report observer by Branco and Masunari (2000) they reported difference in condition factor of males and females in *Callinectesdana*e from Conceicao Lagoon system, Santa Catarina, Brazil. They observed it was probably due to higher weight of the female gonad of the crabs. The differences in results of the exponential equation may be cause due to difference in diet, which resulting size difference, changes incheliped strength, foraging behavior and metabolic rate of species.

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