Pakistan Journal of Marine Sciences, Vol.6(1&2), 93-97, 1997.

ALLOMETRIC STUDY OF SKELETON WEIGHT, BODY WEIGHT AND LENGTH RELATIONSHIP OF *EURYGLOSSA ORIENTALIS* (BL. & SCHN.) (FAMILY : SOLEIDAE) FROM KARACHI COAST

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ABSTRACT: Present study deals with the family Soleidae (common sole) *Euryglossa orientalis* (Bl. & Schn.) of the order Pleuronectiformis from Karachi coast. Separate equation (regression line) for describing the length weight relationships for male and female combined are justified.
Allometric studies were made on skeleton weight relative to the length and the weight of the fish. The regression equation 'a' and 'b' values of standard length/skeleton weight and body weight/skeleton weight are statistically significant.

KEY WORDS: *Euryglossa orientalis*, allometric study, Karachi coast.

INTRODUCTION

Euryglossa orientalis (Bloch and Schneider) is the most commercially important oriental sole in the coastal waters of Pakistan, constituting a significant portion of the food sources for the rapidly growing population of the country. The fish is widely distributed along the Indo Pakistan coast (Day, 1878; 1889; Normal, 1928; Munro, 1955; Misra, 1962; Hussain, 1979; Fisher and Bianchi, 1984). In Pakistan they are caught in bottom trawl and shore seines or occasionally cast nets from the muddy bottom of the continental shelf including estuaries and back waters.

Morphological variations in fishes, as a result of wide distribution and adaptation to the different environments, have been described by various authors (Schmidt, 1921; Tanning, 1944).

Among all animal groups, differences in relative rates of increase in organs or body parts can produce changes in body proportions during the course of growth and produce significant changes of body form. This has been termed as allometric growth. Studies on allometric growth have largely focussed on weight/length relationship or body parts because of growth analysis and homogeneity of the species in the local populations (LeCren, 1951; Marr, 1955; Misra and Chaudhary, 1982; Hoda, 1987). The knowledge of allometric growth in flat-fishes in Pakistan fishery will enable the fishery biologist to become familiar with interesting nature of growth. Therefore, an investigation on the identification of the possible variations in the allometric relative growth of *E. orientalis* from Pakistani waters will be of interest.

MATERIAL AND METHODS

The present study is based on random samples of *E. orientalis* were collected weekly from the commercial landing sites at Karachi Fish Harbour at West Wharf and Korangi Creek during the period from April, 1987 to June, 1988. The samples were kept in frozen

conditions and in laboratory after thawing the fish, they were measured for the allometric study.

Allometric studies were made on skeleton weight relative to the length and the weight of the fish for which adult fish skeletons were exposed by manual removal of muscle and tissue and dried at nearly 45°C in an oven for 24 hours.

The relationships between body weight, skeleton weight and total length were determined after the methods of LeCren (1951) and Tesch (1971) as follows:

The regression equation or allometric equation $Y=aw^b$.

or Log Y=Log a+b LogW (weight/mass).

Where Y = skeleton weight; W = fish body weight; a = intercept, b = slope.

RESULTS AND DISCUSSION

Results obtained are presented in table 1. Relationships obtained between skeleton weight, body weight and standard length are well represented by following equations.

Log Ws = -1.094 + 0.9012 Log Wt. - Eq. 1

Log Ws = -5.535 + 2.843 Log SL - Eq. 2

Log W = -5.1274 + 3.1506 Log TL - Eq. 3

Where Ws=weight of skeleton, Wt=weight of fish; TL=Total Length, SL=Standard Length.

The study shows that the slope 'b' given in Eq.1 is 0.9012 (r=0.958). This is less than 1 which is suggestive of the slow growth of skeleton while Reynolds and Karlotski (1977) found that the 'b' value equaled to 1.0297 for 11 different fish species including flatfishes. This equation was as under:

Log Ws = 1.4797 + 1.0297 Log Wt 10.996

C.L. at 95% for a$\pm$0.157 and b$\pm$0.0689

and relative condition Ws/Wt = 3.175$\pm$0.818

Table 1. Relationship between body weight skeleton weight, total length and weight of fish *Euryglossa orientalis*

	N	Regression line a	b	S.E. a	S.E. b	Coefficients Correlations
S.L./Sk.W.	46	-5.535	2.843	3.0698	0.1342	0.955
B.W/Sk.W	46	-1.094	0.9013	0.0923	0.0404	0.958
T.L/B.W.	745	-5.1274	3.1506	0.0607	0.0260	0.975

The present study shows that the value of 'b' (slope) in the relationship between body weight and skeleton weight is not much different from the value obtained by Reynolds and Karlotski (1977) which is an indicative of slow growth of skeleton. This difference could be less if the number of specimen studied were higher by Reynolds and Karlotski (1977).

The value of 'b' in the relationship between S.L/Sk.Wt. in Eq.2 table 1 (Fig.1) is

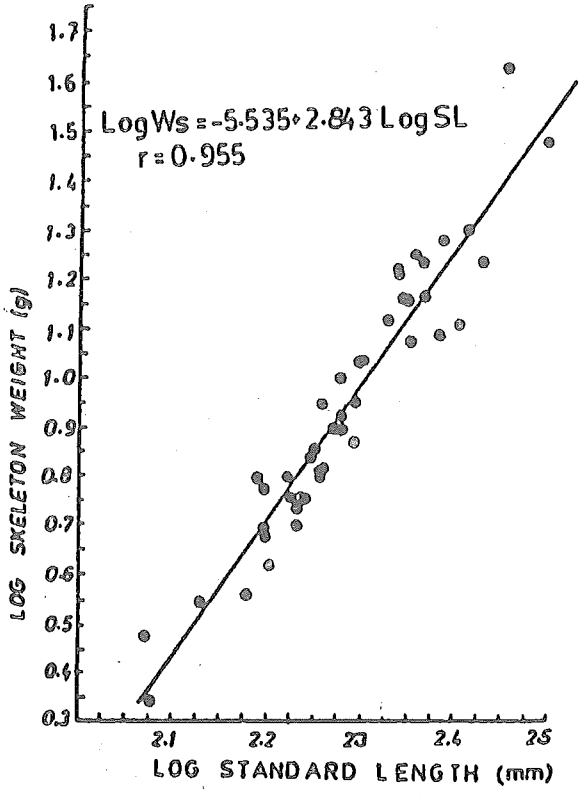

Fig.1. Log-log relationship between standard length and skeleton weight.

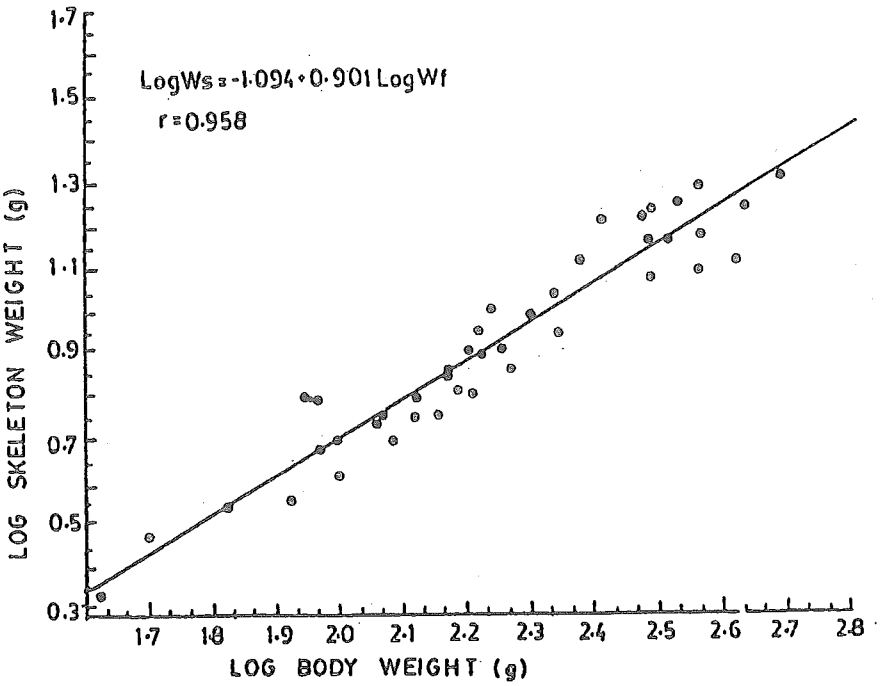

Fig.2. Log-log relationship between fish weight and skeleton weight.

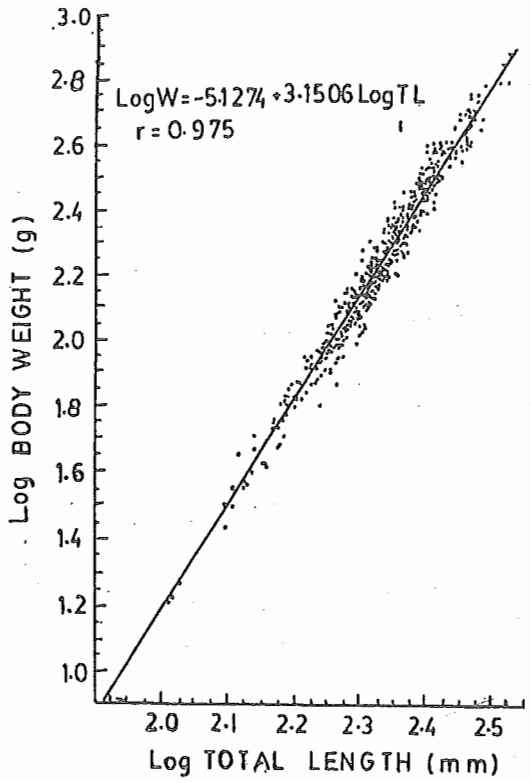

Fig.3. Log-log length weight relationship in male and female combined.

very close to 3 and show a high significance (r=0.955) which is an indication of isometric growth.

Regarding the relationship between length and body weight in Eq.3, the value of 'b' is again close to 3 (b=3.1506) which shows that the fish follow the cubic law of isometric growth (LeCren, 1951). If the value of 'b' in Eq.2 and 3 deviated much from 3 then the growth could be allometric which is not the case over here (Fig.3).

On the basis of the results obtained in this study, it is concluded that the fish obeys the cubic law of isometric growth (Table 1) (Fig.2) while the relationship between the skeleton weight and body weight is directly proportional.

ACKNOWLEDGEMENTS

The authors would like to thank the Director Centre of Excellence in Marine Biology, University of Karachi for providing facilities for the completion of the work. The Director, Marine Reference Collection and Resource Centre, University of Karachi is also acknowledged for providing working facilities.

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(Received: I March 1996)