

LENGTH-WEIGHT RELATIONSHIP OF *MEGALASPIS CORDYLA* (LINNAEUS, 1758)
ALONG NORTH WEST COAST OF INDIA.

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ABSTRACT

Total length and total weight relationship of *Megalaspis cordyla* (Linnaeus, 1758) a carangid fish, along North west coast of India has been worked out. The fish is an ideal one, growing by weight @ cube of its length, isometrically, retaining its specific body shape throughout its life. The relationship is $W = 0.00906279 L^{2.9824152}$, where "W" is total weight of fish in g and "L" represents total length in cm.

A mathematical representation of length weight relationship derived from study of a number of specimens of different sexes and sizes from a particular area is a very useful tool for study of population dynamics and the general condition of the studied population. Any deviation from the relationship thus derived indicates variation in the ecology of the habitat or physiology of the fish or both. The study is valuable for forecasting the recruitment and potential yield and thus helps in management of fishery. According to Le Cren (1951), "Length of a fish is often more rapidly and accurately measured than weight. It is very convenient to be able to determine a weight where length only is known and occasionally it may be useful to reverse the process". Besides providing a means for calculating weight from length it may also give indication of taxonomic difference and events in the life history of the studied fish. Importance of study of this aspect of biology has led various authors to work on this aspect. Some of them are Le Cren (1951), on *Perca fluviatilis*; Krishnamoorthy (1971), and Acharya (1980) on *Nemipterus japonicus*; Sithamparam & Dwivedi (1982), on *Upeneus moluccensis*; Acharya and Bhattacharya (1983), on *U. sulphureus*; Bhattacharya and Acharya (1984), on *Polynemus heptadactylus*; Acharya and Dwivedi (1986) on *Trypauchen vagina* etc.

Megalaspis cordyla or Horse mackerel constitutes an important fishery along the North-west coast of India. An exploratory survey conducted by a Polish vessel M.T. *Mureana* during 1977 in the area between 15° N latitude and about 24° N latitude on the North-west coast of India indicated that there exists a potential fishery and fishing grounds of Horse mackerel off North-west coast of India.

M.T. *Mureana* also landed huge catches of Horse mackerel during the survey. In spite of its high potential, studies on its morphometry, habitat, biology and other aspects are limited. The present

study was undertaken to work out the length-weight relationship of this species along the North-west coast of India.

A total of 317 specimens comprising 63 indeterminants, 119 females and 135 males representing different size groups ranging 11 - 43.1 cm in total length and 10 g - 610 g in total weight, were obtained from three major landing centres, namely, Sassoon dock, Ferry Wharf, Versova and also from the catches of CIFE's research-cum-training vessel M.F.V. *Saraswati*, cruising along the North-west coast of India. Data was collected for the period of one year from October, 1986 to September, 1987. Total length in cm of the fish was taken on a fish-measuring board and total weight in g after removing moisture of the specimens by blotting paper. The data of total length and total weight were statistically treated by least square method and put in its logarithmic form by using the general formula $\log W = a + b \log l$. Analysis of covariance technique was used to test the significance of the difference of growth in length and weight of this species between sexes (males, females and indeterminates). The analysis revealed that there is a significant difference in the growth in terms of length and weight between the sexes at 5% level of the significance, whereas the difference in the growths within the sex is not significant. Further, to identify the sex in which the growth is more, critical difference analysis technique was used. The analysis revealed that the growth in weight is considerably more in males and females than that of undetermined sex. However, similar analysis also indicated that there is no significant difference in the growth of length between the sexes. The critical difference technique was carried out at 5% level of significance by using 't' test.

A curvilinear relationship was obtained by plotting total weight of the specimens of different length

groups against their total lengths (Fig. 1).

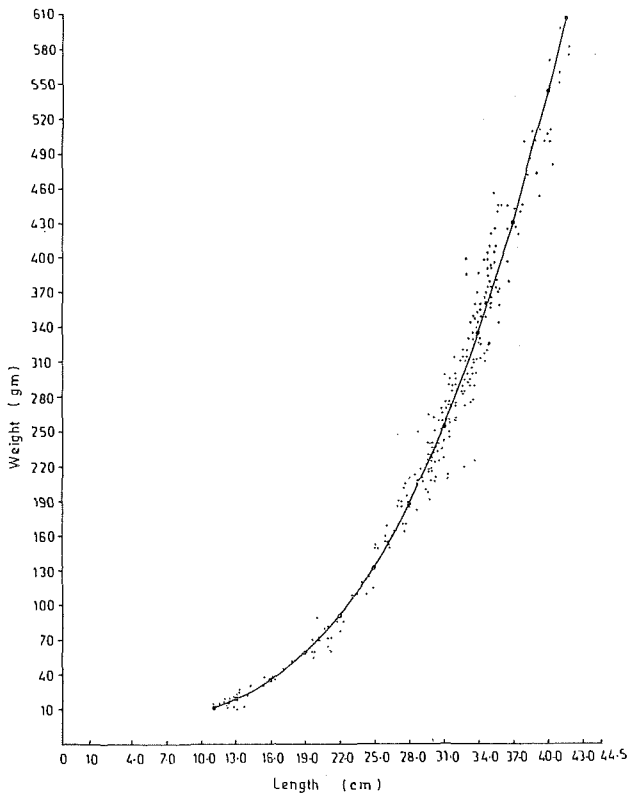


Fig. 1 : Length-weight relationship of *M. cordyla*

Like other animals, as the fish grows, the rate of growth by weight also becomes faster than its length. Log of calculated total weight and total length were treated with general formula $W = aL^b$. Values of constant a and exponent b were determined as 0.00906279 and 2.9824152 respectively. Thus the length-weight relationship of *M. cordyla* along the North west coast of India was worked out to be $W = 0.00906279$

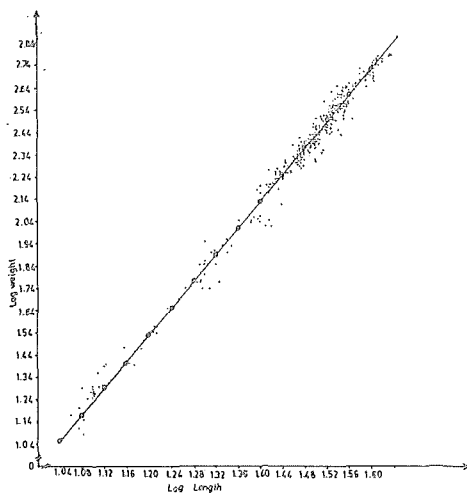


Fig. 2 : Logarithmic length-weight relationship of *Megalaspis cordyla*

$L^{2.9824152}$ and $\text{Log } W = -2.0427379 + 2.9824152 \log L$. The logarithmic form of length - weight relationship gives a straight line (Fig.2). 'b' value (2.98) indicates that the growth of the fish by weight is proportionate to the cube of its length, the fish maintain its specific body shape throughout its life. The coefficient of correlation (r) was 0.98 indicating that the compared characteristics (length and weight) of this fish are highly correlated to each other. The value of exponent (coefficient of regression) $b = 2.9824152$ did not differ significantly from 3 which is the indication of isometric growth.

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