LENGTH WEIGHT RELATIONSHIP IN THE THREADFIN-BREAM, *NEMIPTERUS JAPONICUS* ALONG THE KERALA COAST

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The length-weight relationship in *N. japonicus* of the Kerala coast shows no change in the form of the relationship when classified according to maturity and sex. The t-test shows that the cubic law does not hold good for this species. Instances of more than one value of weight for a given value of length are found more frequently in females than in males. A comparison of the relationships for the Andhra-Orissa coasts with those of the Kerala coast gives some differences which probably signify that separate stocks may exist in the Bay of Bengal and the Arabian Sea.

Nemipterus spp. are caught largely from a depth of 10-60 fathoms. The important species along the Kerala coast is *N. japonicus* and it is available almost throughout the year. The maximum catch is recorded in September. A study of the length weight relationship of the fish was made and the results are presented here.

The material for the study was collected at Cochin from the vessels of the Integrated Fisheries Project, the Central Institute of Fisheries Operatives and the Offshore Fishing Station. The samples represent the fish caught along the Kerala coast for a period of one year. A total of 400 fish ranging from 96-280 mm in total length was considered for this study. After removing the surface moisture, each fish was measured and weighed nearest to 1 mm and 0.5 gm accuracy respectively.

The well-known form, in which the weight of the fish is expressed as a function of its length, is:—

$$W = aL^n \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

where W is the weight, L is the total length and 'a' and 'n' are constants.

Taking the logarithm of both sides, the equation (1) becomes

$$\log W = \log a + n \log L \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Estimates of the constants 'a' and 'n' are obtained by the usual method of least squares.

Category	Linear equation	S.E. of the reg. coeff.
Immature males	log W = $\bar{5}$.3895 + 2.8925 log L	0.0283
Immature females	log W = $\bar{5}$.4786 + 2.8517 log L	0.0376
Mature males	log W = $\bar{5}$.4968 + 2.8386 log L	0.0330
Mature females	log W = $\bar{5}$.3599 + 2.9004 log L	0.0358

The length-weight relationships were worked out separately for the categories: immature males, immature females, mature males and mature females. The linear relationships and the standard errors (S. E.) of the regression coefficient for each category are given below.

The errors in the regression coefficients are relatively lower in males than in females. This indicates that in the case of females, more than one weight is obtained for a given length more frequently than in the males.

For testing the difference in the regression lines, the analysis of covariance table is layed out below, following Snedecor and Cochran (1967).

	d.f	Σx^2	Σxy	Σy^2	Reg. coef.	Deviations from regression d.f.	S.S.	M.S.
Within								
1. Immature males	99	0.85342	2.46850	7.20699	2.89248	98	0.06690	0.00068
2. Immature females	99	0.50512	1.44045	4.17761	2.85170	98	0.06988	0.00071
3. Mature males	99	0.62764	1.78164	5.12426	2.83863	98	0.06690	0.00068
4. Mature females	99	0.60163	1.74496	5.13659	2.90040	98	0.07551	0.00077
5.						392	0.27919	0.00071
6. Pooled, within	396	2.58781	7.43555	21.64545	2.87330	395	0.28088	0.00071
			Difference between slopes			3	0.00169	0.00056

Σx^2, Σy^2 and Σxy are the corrected sums of squares and products. x and y have the usual meaning.

Comparision of slopes: $F = \frac{0.00056}{0.00071} = 0.7887$ (d.f. – 3, 392) not significant

The F-value being non-significant, the slopes of the regression lines do not show real difference. Therefore, by pooling all the data a general relationship was obtained as

log W = $\bar{5}$.4793 + 2.8487 log L.

the S.E. of the reg. coef. being 0.0152. A plot of the log W on Log L and the common regression line are shown in the Fig. 1. The Fig. also shows that a single line fits the data adequately.

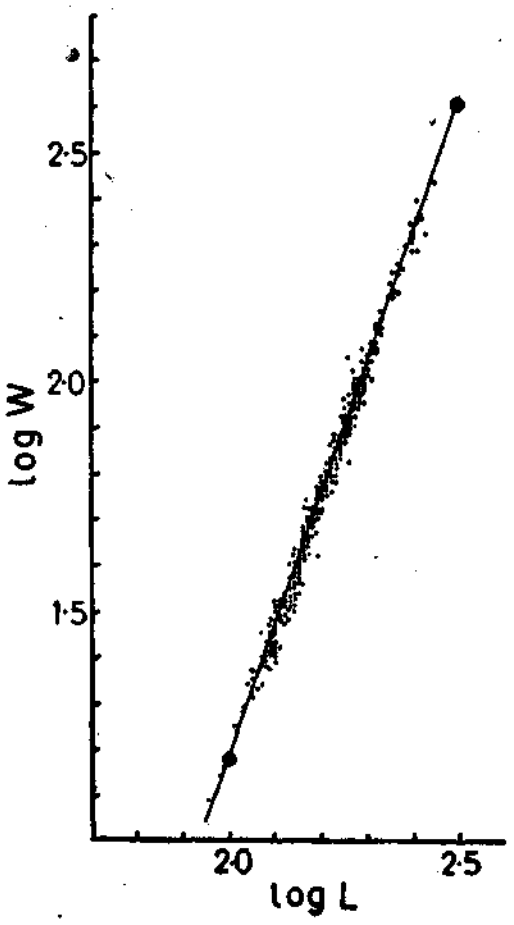

FIG. 1. A plot of the log W on log L and the common regression line.

Eggleston (1970) found a difference in the form of length-weight relationship between males and females of *Nemipterus virgatus* particularly when classified according to its length and spawning season. His data relate to the fish caught from the northern part of the South China Sea and the southern part of the East China Sea.

Krishnamoorthi (1971) found significant difference between male and female length-weight relationships for *N. japonicus* of Andhra-Orissa coast. For comparing the relationships for the two coasts his equations are given below:

Males: $\log W = \bar{3}.2435 + 2.0769 \log L$

Females: $\log W = \bar{5}.2625 + 2.9423 \log L$

For the Kerala coast, the relationships for males and females turn out to be:

Males: $\log W = \bar{5}.5038 + 2.8376 \log L$

Females: $\log W = \bar{5}.4352 + 2.8689 \log L$

For *N. japonicus* of the Kerala coast, no significant difference between males and females was found in the length weight relationships. As 'a' depends upon the obesity of the fish (Le Cren, 1951), by comparing the 'log a' values it becomes obvious that the general fatness in the two sexes is different for the fish of the Andhra-Orissa coast. The regression coefficients for the Kerala and Andhra-Orissa coasts seem to show difference especially in the males. Thus the two stocks of *N. japonicus* appear to be different.

The well-known general concept on the length weight relationship is that the weight of the fish would vary as the cube of its length. But as the specific gravity and the shape or body outline of the fish are subject to changes, the cubic law need not hold good always (Rounsefell and Everhart, 1953). Sekharan (1968) found significant departure from the cubic law in the case of *Sardinella albella* and *Sardinella gibbosa*. This departure is tested by applying the t - test for the significance of the difference of the regression coefficient from 3. The regression coefficient and its standard error for the general relationship being 2.8487 and 0.0152 respectively, the t - value is: -9.93 (obtained by subtracting 3 from the regression coefficient and dividing the result by the S.E.). This has a degree of freedom 398. The t - value obtained is highly significant, showing that the cubic law does not hold good for *N. japonicus* of the Kerala coast.

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