

LENGTH-WEIGHT RELATIONSHIP AND RELATIVE CONDITION FACTOR IN *OTOUITES RUBER* (SCHNEIDER, 1801) FROM THE GULF OF MANNAR AND PALK BAY

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ABSTRACT

The regression coefficients of length-weight relationship in females and males *O. ruber* showed no significant difference and a common regression is recommended. The regression coefficients depart significantly from 3. Total length-relative condition factor curve showed first major inflexion at 200 mm.

Sciaenids are among the important groups of fishes landed by commercial trawlers in Indian waters. Information on length-weight relationship and relative condition factor of several sciaenid species is available (Rao, 1963; Nair, 1977; Murty, 1979, 1980; Muthiah, 1982; Rao, 1982; Vivekanandan, 1985; Jayasankar, 1989). *Otolithes ruber* is one of the sciaenids exploited in the Gulf of Mannar and Palk Bay. From the west coast, biology of this species has been studied by several workers (Vaidya, 1960; Devadoss, 1969; Nair, 1980; Pillai, 1983). However, none of these workers have studied length-weight relationship or relative condition factor of the species. No work is done on the biology of *O. ruber* from the Gulf of Mannar and Palk Bay. Hence the present study has been carried out.

Samples of *O. ruber* were collected from the commercial trawlers operating in the Gulf of Mannar and Palk Bay of Mandapam, Pampan and Rameswaram landing centres during the years 1988 and 1989. Total length in mm (from tip of snout to the tip of longest ray in the caudal fin) and weight (nearest to 0.1 g) were recorded separately in females and males. The

study is based on 150 females of the length range 97-360 mm and 117 males ranging in length from 70 to 259 mm.

The length-weight relationship was calculated using the formula

$\log W = \log a + b \log L$, where W = weight in g, L = total length in mm and 'a' and 'b' constants. Significance of difference at 5% level between the regression coefficients of the sexes was tested by ANOCOVA (Snedecor and Cochran, 1967). To test whether the regression coefficients depart significantly from 3, Y test was conducted.

The Relative condition factor, K_n (Le Cren, 1951) was estimated using the equation, $K_n = W/w'$, where W represents observed weight and W' the calculated weight derived from the length-weight relationship.

The length-weight equations obtained are as follows:

females: $\log W = -5.6620 + 3.2899 \log L$; $r^2 = 0.9843$

males: $\log W = -5.5598 + 3.2426 \log L$; $r^2 = 0.9779$

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NOTE

The Analysis of Covariance revealed no significant difference in the regression coefficients of the sexes (Table 1). Hence the data on sexes were pooled (Fig. 1) and a common equation was calculated as follows:

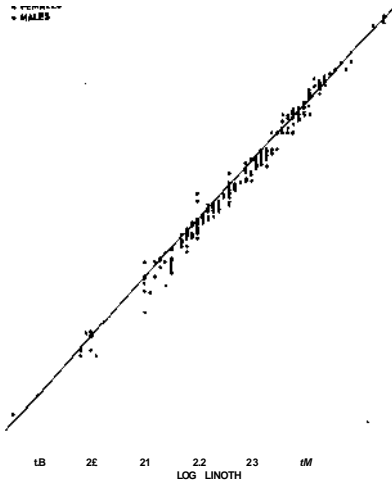


Fig. 1. Length-weight relationship in *Otolithes ruber*.

$$\log W = -5.6285 + 3.2744 \log L; r^2 = 0.9823$$

In the 't' test for determining the variation of V from 3, the t value in females (8.48; df = 148), males (5.33; df = 115) and pooled samples (10.15; df = 265) showed that the regression coefficients are significantly different from 3.

Fig. 2 shows variation in Kn values plotted at 20 mm length groups of female *O. ruber*. The relative condition factor, after a marked increase at 160 mm, plummeted at 200 mm.

In the length-relative condition factor curve, the point of inflexion is indicative of the length at which sexual maturity starts (Hart, 1946). This point in the present study was 200 mm. The observation that *O. ruber* matures for the first time at about 198 mm (Davados, 1969) lends support to the present results. Such a relationship between condition factor and size at first maturity has been reported in other sciaenids also (Rao, 1963; Nair, 1977; Muthiah, 1982; Jayasankar, 1989).

TABLE 1. Comparison of regression lines of female and male *Otolithes ruber* by ANOCOVA

	df	xy	y ¹	Deviation from regression		
				df	SS	MS
Within						
1. Females	149	2.48584	8.17814	148	0.429980	0.002905
2. Males	116	1.56301	5.06823	115	0.372123	0.003236
3. Total				263	0.802103	0.003050
4. Pooled (W)	265	4.04885	13.24637	264	0.804248	0.003046
5. Difference between slopes				1	0.002145	0.002145
6. Between B		0.11395	0.38423			
7. W+B	266	4.16280	13.63060	265	0.805750	0.003041
8. Between adjusted means				1	0.001502	0.001502

Comparison of slopes: $F = \frac{0.002145}{0.003050} = 0.70328$ (df = 1,263)
0.003050 Not significant

Comparison of elevation : $F = \frac{0.001502}{0.003046} = 0.49311$ (df = 1,263)
0.003046 Not significant

NOTE

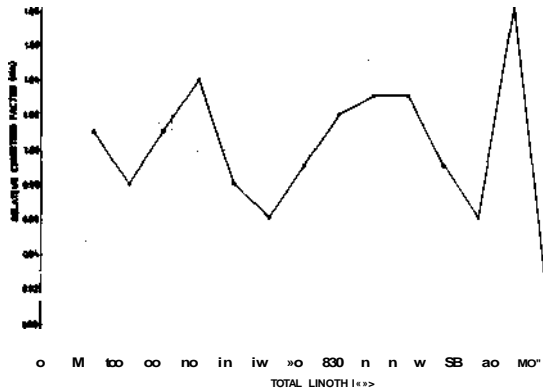


Fig. 2. Mean Kn values at different lengths of *Otolithes ruber*.

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