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Length-weight relationship and relative condition factor in *Sillago sihama* (Forsskal) from Mandapam region

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Sillago sihama forms about 60% of all sillaginids commercially exploited in the gulf of Mannar and Palk Bay landing centres of Ramanathapuram district in Tamil Nadu (Jayasankar 1991). Only a preliminary study on the length-weight relationship and condition factor of *S. sihama* was made by Radhakrishnan (1957) from Mandapam area. Later work (Jayasankar 1991) showed a marked difference from Radhakrishnan's results on condition factor. This study re-examins the issue.

Samples of *S. sihama* were collected from the commercial trawlers in (he gulf of Mannar and Palk Bay off Mandapam, Pamban and Rameshwaram landing centres during April 1987 to March 1988. Total length in mm (from tip of the snout to tip of upper caudal lobe) and weight (nearest to 0.1 g) were recorded separately for males and females. In this study, 268 males of 99-218 mm and 353 females of 109-252 mm were considered.

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 (Snedecorand Cochran 1967). To test whether the regression coefficients depart significantly from 3, t test was conducted.

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

The length-weight equations (Fig. 1) obtained are as follows:

Male : log W=-5.1774 +3.0305 log Lir[1] =0.96

Female: log W=-5.4248 + 3.1445 log L; r^2 =0.98

The Analysis of covariance revealed significant ($P<0.05$) difference in the regression coefficients (Table 1), necessitating separate regression equations to express their length-weight relationship. Krishnamurthy and Kaliyamurthy (1978), while comparing the length-weight relationships of juvenile and adults of *S. sihama* from Pulicat lake, observed that the slopes ofregression lines did not differ significantly, but the elevations showed difference at 5% level.

In the t test, for determining the variat'on ofb from 3, the t value in males (0.21; df=266) and females (0.95; df = 351) showed that the regression coefficients were not significantly different from 3, indicating an isometric growth in the species. Krishnamurthy and Kaliyamurthy (1978) also observed the same in *S. sihama* from Pulicat lake. But in Gangetic whiting, *Sillago panijus* (Ham. Buch.), Krishnayya (1963) observed highly significant

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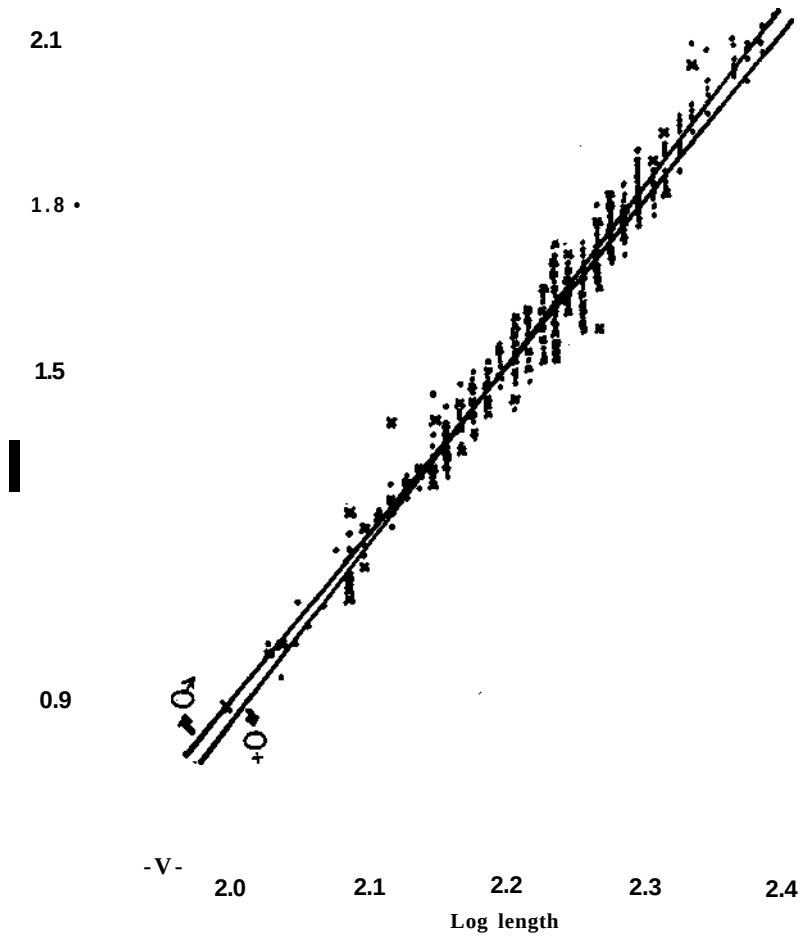

Fig. 1. Length-weight relationship in *Sillago sihama.*

Table 1. Comparison of regression lines of male and female *Silllago sihama* by ANOCOVA

	df	X^2	*y	y'	Deviation from regression		
					df	SS	MS
Within							
Males	267	0.7642	2.3159	7.3112	266	0.292890	0.0011011
Females	352	1.6531	5.1982	16.6727	351	0.326875	0.0009313
Total					617	0.619765	0.0010045
Pooled	619	2.4173	7.5141	23.9839	681	0.626560	0.0010139
Difference between slopes					1	0.006795	0.0067950

F, 6.76 (df: 1, 617) significant at 5% level.

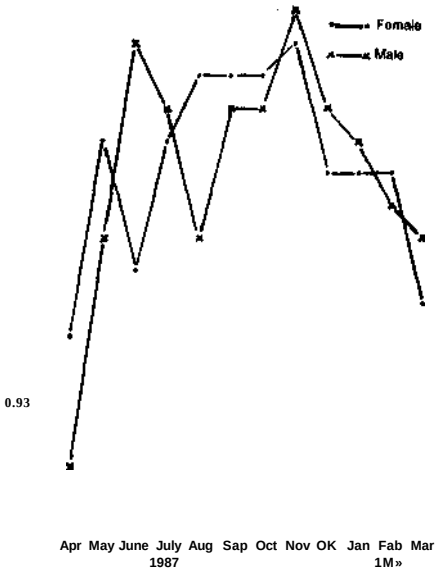

Fig. 2. Monthly variation in relative condition factor in *Sillago sihama.*

difference in the regression coefficients of immature and mature fish and also they departed significantly from 3.

Fig. 2 shows monthly variation in Kn values of *S. sihama*. In both the sexes, the relative condition factor remained high during July to November, with peak in November. It plummeted in December, showing further decline till April. *S. sihama* has a prolonged breeding season from July to February with peak spawning in November in Mandapam waters (Jayasankar 1991). The rise in Kn value from July corresponded to the period of gonadal maturation. The abrupt fall in condition in December, in both the sexes, may be attributed to increased spawning activity. Higher condition factor values observed during July-February in 5. *sihama* from Pulicat lake, were attributed to full maturity of gonads (Krishnamurthy and Kaliyamurthy

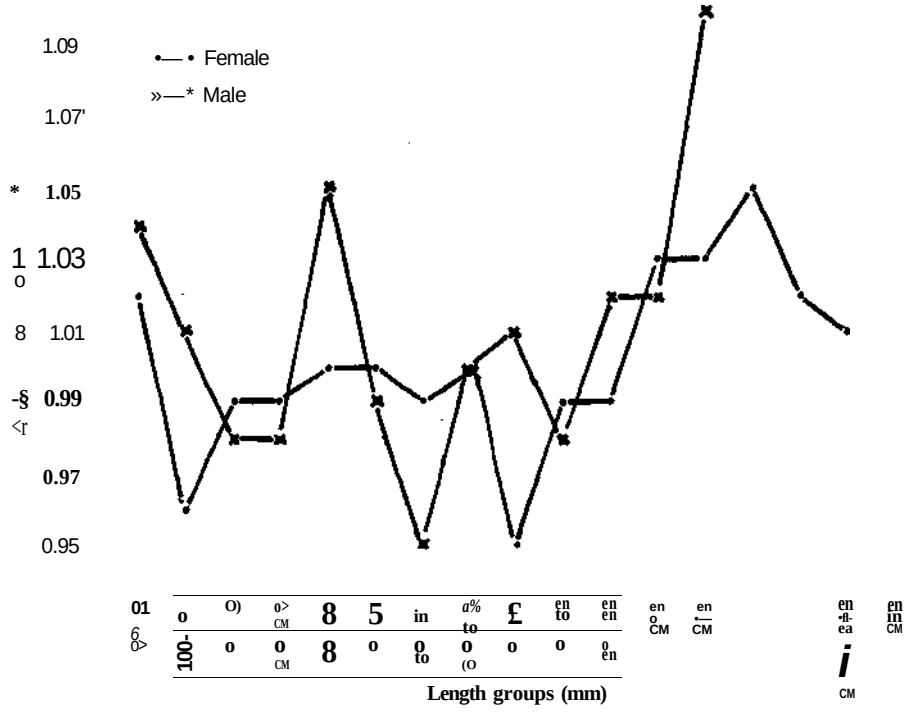

Fig. 3. Variation of relative condition factor in different length groups of *Sillago sihama.*

1978). Low Kn val ucs in January and August in *S. Panijus* were ascribed to spawning (Krishnayya 1963).

Variation in Kn values at 10 mm length groups of male and female *S. sihama* (Fig. 3) showed the relative condition at its lowest in 150-159 mm length group in males and 170-179 mm length group in females. In the length-weight relationship, the point of inflexion is indicative of the length at which sexual maturity starts (Hart 1946). The present results support this observation since male and female 5. *sihama* became mature for the first time at 159 and 179 mm, respectively (Jayasankar 1991). Radhakrishnan's (1957) data on condition factor indicated that the species matured for the first time at about 130 mm. Krishnamurthy and Kaliyamurthy (1978) stated that a peak in condition factor recorded at 140-145 mm probably indicated the onset of maturity and the other peak at 205-225 mm coincided with the 50% level of maturity. However, male and female were not considered separately in their studies.

The number of peaks and valleys in the Kn curve may be an index of the number of spawnings during the life span of the fish (Dcvraj 1973). The persistently low Kn values fluctuating between 159 and 209 mm in *S. sihama* are suggestive of prolonged breeding season.

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