

PRELIMINARY OBSERVATIONS ON THE MORPHOMETRIC
CHARACTERISTICS, LENGTH WEIGHT RELATIONSHIP, FOOD
AND FEEDING HABITS AND FECUNDITY OF SAURIDA
TUMBIL (BLOCH) OFF BOMBAY COAST

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ABSTRACT

Fifteen morphometric and four meristic characters of *Saurida tumbil* were studied and their relationships with total length and head length were established. The length weight relationship worked out to be $W = 5.6055 L^{3.291}$. The fish is a carnivore, feeding mainly on small fishes, molluscs and crustaceans. Larger fishes are selective feeders on fish. It is a long protracted spawner. Fecundity varied from 6008 to 17384 eggs in specimens of size group 212-420 mm. Fecundity-total length, fecundity-total weight of fish and fecundity - total weight of ovary relationships were worked out to be $F = 0.9414 L^{1.6626}$, $F = 180.7069 W^{0.7531}$ and $F = 3153.0375 W^{0.8278}$ respectively.

Saurida tumbil (Bloch) locally called as 'Chor Bombil' is caught throughout the year along the Bombay coast, still, only scanty information is available on the biology of this species (Gopinath, 1946; Vijayaraghavan, 1957; Kuthalingam, 1950; Bassiruddin and Nair, 1961 from Madras coast and Annigeri, 1967 from Bay of Bengal). With reference to Bombay coast, only Dighe (1977) worked on some aspects of biology of this species. The present study deals with the morphometry, length weight relationship and selected biological aspects of *S.tumbil*.

For the present investigation a total of 100 fishes ranging between 200-420 mm in total length and 100-420 g in total weight were examined. Samples were

collected at weekly intervals from Sassoon Dock and Ferry Wharf landing centres of Bombay during August, 1989 to February, 1990. Standard procedure adopted by Dwivedi and Menezes (1974) was followed to study morphometric features. Monthwise and lengthwise percentage composition of food items has been worked out following volumetric method (Pillay, 1952) and accordingly 40, 30, 20, 10 and 5 points were allotted respectively for full, 3/4, 1/2, 1/4 full guts and guts with trace food items. No gorged stomach was encountered. Feeding intensity was determined on the basis of percentage of stomachs encountered in different degrees of fullness. Fecundity was determined following gravimetric method. Correlations between fecundity and total length; fecundity and total

weight; and fecundity and total ovary weight were worked out following least square method.

The study of morphometric characteristics of *S.tumbil* reveals simple straight line regressions of standard length (SL), Head length (HL), Dorsal length (DL), Pectoral length (PL), Ventral length (VL), Anal length (AL), Predorsal length (PDL), Prepectoral length (PPL), Preventral length (PVL), Preanal length (PAL) and minimum Body depth (BD) on Total length (TL)

and Snout length (SL), Eye Diameter (ED), Interorbital length (IO) and Cleft of mouth (CM) on Head length indicate positive allometric growth relationship and high degree of co-relations between compared characteristics as evident from r^2 values (Table 1). Regression 'b' values indicate that growth in Anal length, Standard length and Preanal length in relation to Total length; and cleft of mouth in relation to Head length, are much faster than other morphometric characters. Main meristic characteristics viz. number of spines and rays of dorsal,

Table 1 : *Corelation of different meristic characteristics of S.tumbil.*

Relationship	Y-intercept (a)	Slope (b)	Coefficient of corelation (r)	Coefficient of determination (r^2)
Characters compared with Total length				
Standard length (SL)	0.412462	0.797982	0.98174	0.963818
Head length (HL)	- 0.11468	0.221518	0.966923	0.93494
Dorsal fin length (DL)	- 0.23679	0.12542	0.937065	0.87091
Pectoral fin length (PL)	0.0119848	0.113879	0.933388	0.871214
Ventral fin length (WL)	0.522052	0.138836	0.927998	0.86118
Anal fin length (AL)	0.0733072	0.813507	0.732189	0.536101
Predorsal fin length (PDL)	0.522661	0.33122	0.951182	0.904747
Prepectoral fin length (PPL)	0.863948	0.218824	0.890895	0.793694
Preventral fin length (PVL)	- 0.0415726	0.316949	0.968446	0.937889
Preanal fin length (PAL)	- 0.147305	0.620132	0.981435	0.963214
Minimum depth (MD)	0.353553	0.0494664	0.629631	0.396435
Characters compared with Head length				
Snout length	0.183482	0.215372	0.834791	0.696875
Orbit diameter	0.396755	0.112353	0.578266	0.334391
Interorbital diatance	0.385488	0.195261	0.575438	0.381129
Cleft of mouth	0.428451	0.592968	0.940326	0.884213

pectoral, ventral and anal fins counted in 50 specimens were found to be in conformity with the numbers given in FAO (1984) and hence further studies on meristic characters were discontinued.

The length and weight relationship for *S.tumbil* is worked out to be $W=0.56055 L^{3.2916}$ (Fig. 1). This indicates that the fish follows the cube law, its growth is proportionally three dimensional. With increasing age, rate of growth in terms

of weight in this fish becomes faster than that of its length.

The study of food and feeding habit shows that fishes, molluscs and crustaceans are the main food items of the fish. Among food fishes, small *Nemipterus* sp. *Trichiurus* sp., *Rastr-elliger kanagurta* were encountered. Molluscs were represented by *Loligo* and *Sepia*, where as *Acetes* sp. and small shrimps formed the main crustacean diet.

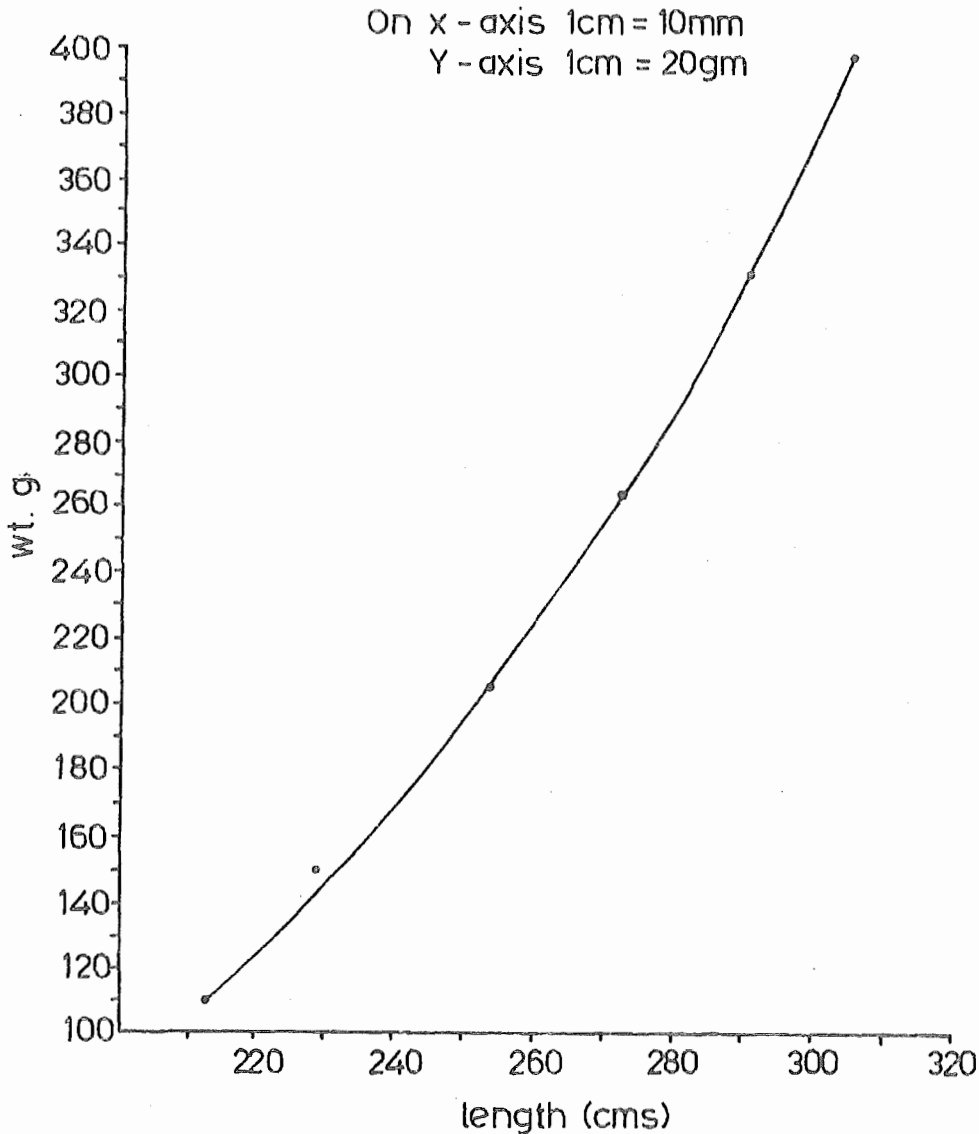


Fig. 1 : Length - weight relationship

Table 2 depicts monthwise percentage composition of different food items encountered in the guts. Fishes were consumed in bulk (33.83 to 90.12%) in all months followed by molluscs (6.94-66.17%). Length group-wise percentage composition (Table 3) indicates that *S.tumbil* depends more on fish for food as it grows. The largest group (321-340mm) in present investigation was found to depend entirely on fish food, whereas molluscs diet decreased with

growth and larger fishes above 281 mm did not take any crustacean food at all. Feeding intensity was highest in February followed by August, September, November, December, January and October.

Fecundity ranged from 6008 to 17384 eggs in the fishes ranging 212-420 mm in total length and 118-456 g in total weight. Relationship between fecundity and total length (TL) fecundity (F) and total weight of fish (W) and fecundity

Table 2 : *Percentage composition of main food items in relation to months.*

Months	Main Food items (Percentage)		
	Fishes	Molluscs	Crustaceans
August	90.12	6.94	2.94
September	70.90	25.40	3.70
October	48.80	48.51	8.69
November	46.27	51.72	2.01
December	46.97	51.94	1.09
January	33.83	66.17	-
February	85.82	8.12	5.36

Table 3 : *Percentage composition of main food items in relation to length.*

Length groups (mm)	Main food items (percentage)		
	Fishes	Molluscs	Crustaceans
201-220	43.90	51.22	4.88
221-240	65.56	31.74	2.70
241-260	63.00	30.04	6.96
261-280	76.34	20.66	3.00
281-300	82.39	17.61	-
301-320	93.57	6.43	-
321-340	100.00	-	-

and ovary weight of fish are $F=0.9413 L^{1.6626}$, $F=180.7069 W^{0.751}$ & $F=3153.0375 W^{0.8278}$, respectively. Fecundity and fish length relationship was slightly curvilinear indicating that with increase in length the rate of increase in number of ova is slightly more. Fecundity - fish weight and fecundity ovary weight indicated linear relationships.

Authors are indebted to the Director, CIFE, Bombay for providing all facilities and to Shri D.K. Gulati for his assistance in statistical analysis of data and to Shri R.P. Swamy for secretarial assistance.

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