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Morphometry and length-weight relationship of *Megalaspis cordyla* (Linnaeus, 1758) off Ratnagiri coast, Maharashtra

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ABSTRACT

Morphometric and meristic characters of *Megalaspis cordyla* of Ratnagiri coast have been studied and the relationship of morphometric characters with total length were established. The morphometric characters revealed positive allometric growth and high interdependence ('r' 0.76-0.99). The analysis of covariance did not show significant difference in length-weight relationship between sexes. The relationship is described as Log W = - 4.2569 + 2.6682 Log L.

Key words: Morphomentry, *Megalaspis cordyla*, Ratnagiri.

M*egalaspis cordyla*, popularly known as 'Torpedo trevally' or 'True horse mackerel' is an important carangid resource of Indian waters belonging to order Perciformes[10]. It is the only member of the monotypic genus *Megalaspis*. The species is easily distinguished from other carangid as no other species of Carangidae has the combination of lateral line with very large scutes and posterior soft dorsal and anal fin rays consisting of a series of detached finlets[2].

It is migratory pelagic species, very much abundant near the surface layer of both inshore and offshore oceanic waters; distributed mainly from 20-80m bottom depth. It is caught along Ratnagiri to the Gulf of Mannar area and is reported to have tremendous scope for expansion of its fishery in the states of Karnataka, Tamil Nadu and Kerala[7]. Large resources of this species were identified first time along the Northwest coast in Indian waters reported by Bapat *et. al.*, 1982.

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It is distributed throughout the tropical and subtropical waters of the Indian Ocean and west Pacific Ocean. They are mostly caught by using trawls, purse seines and drift gill nets[10]. Horse mackerel has shown increasing trends as it can be seen from the data that annual production recorded during decade 1981 was about 2,418 t, which has increased to 20,765 t during the decade with an average annual production[8] of 6,627 t. During 1993-2009 the production was increased from 16,074 to 35,723 t (CMFRI, 2010). The overall production of Carangids in Ratnagiri during 2010-2011 is about 26,464 per tonnes[1].

As *M. cordyla* is dominant species among carangids in the commercial catches of Ratnagiri. In the present paper an attemp has been made to define identification characteristic of *M. cordyla* of Ratnagiri region through morphometric as well as meristic characters and length-weight relationship.

A total of 1000 individuals comprising of 326 males and 428 females and 246 indeterminants in the length range of 152 to 402 mm were collected randomly, at weekly intervals from Mirkarwada landing centres of Ratnagiri from March 2011 to February 2012 for present study. Fresh specimens were utilized for the study of morphometric and length-weight relationship. Fish specimens were measured to the nearest of mm using divider and measuring board. Fifteen morphometric and two meristic characters were studied and relationships between the various body measurements to the total length have been calculated. The relationship between the characters was worked out by the formula of simple linear regression equation: $Y= a + bX$. For studying length-weight relationship, the total length was measured to the nearest of millimeter from the tip of the snout to the tip of the longest caudal fin ray of lower lobe and then weight to the nearest gm. The data of total length and weight were statistically treated by the method of least square using the equation of LeCren[6] given as: $\log W = \log a + b \log L$

Where ‘a’ and ‘b’ are constants estimated by linear regression of the log transformed varieties. Length-weight relationship was determined separately for males, females, indeterminants and total.

During the present investigation on the morphometry of *M. cordyla*, the coefficient of correlation (r) for various characters compared against total length ranged from 0.76 to 0.99 indicating high degree of relationship among the characters compared (Table-1). The high values of correlation coefficient (0.76-0.99) obtained for various morphometric characters compared with total length indicate high degree of interdependence of these compared characters. Among all the characters compared with total length, fork length (b=0.8929) and standard length (b=0.8142) indicated high growth rate while for caudal depth (b=0.0238), orbital diameter (b=0.0428) and snout length (b=0.0485) growth was very slow (Table-1).

The meristic characters showed limited variation in there range. During present study, the number of scutes recorded vary from 42-60 and the pyloric caecae were found in between 215 to 382 numbers.

Morphometric and meristic characters

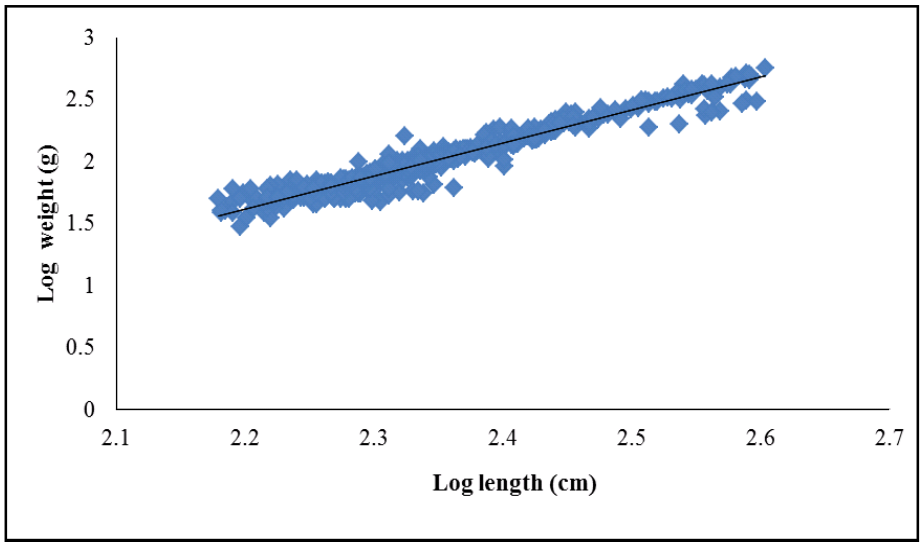

Fig. 1. Logarithmic relationship between length and weight in the total of *M. cordyla*

Table-1. Regression values for various morphometric characteristics of *M. cordyla* along Ratnagiri coast

Characteristics		Regression parameters		
Sr. No.	Compared with Total length (TL)	a	b	r
1	Fork length (FL)	0.2207	0.8929	0.99
2	Standard length (SL)	-0.0202	0.8142	0.99
3	Snout length (UO)	0.2044	0.0485	0.88
4	Head length (YJ')	1.0294	0.1660	0.90
5	Orbital diameter (OO')	0.1683	0.0428	0.91
6	First dorsal fin base length (D1D1')	0.3397	0.0883	0.88
7	Second dorsal fin base length (D2D2')	1.1898	0.1043	0.76
8	Pectoral fin length (Ph)	-1.7740	0.3405	0.98
9	Pelvic fin length (Vh)	0.2452	0.0921	0.95
10	Anal fin length (AA')	0.4359	0.0839	0.84
11	Body depth (h)	0.4089	0.2063	0.95
12	Caudal depth (Cd)	0.0730	0.0238	0.79
13	Lower Jaw length (Ljl)	-0.1791	0.1097	0.88
14	Length of straight lateral line (Llt)	-0.0948	0.5301	0.98

Table-2. Estimates of intercept (a), slope (b) and correlation coefficient (r) for length-weight relationship of *M. cordyla* obtained by different investigators

Author	Location	Sex	Sample size	Intercept (a)	Slope (b)	Correlation (r)
Jaiswar and Acharya (1991)	Northwest coast of India	Combined	317	-2.042738	2.982415	0.98
Ruben *et. al.*, (1992)	East coast	Combined	-	-4.904388	2.940436	-
	Northeast coast	Combined	-	-2.893904	2.527019	-
	Southwest coast	Combined	-	-4.292663	2.717717	-
Sivakami (1995)	Cochin	Males	89	-4.050194	2.583285	0.962795
		Females	188	-4.749639	2.864025	0.993228
		Combined		-4.311030	2.687944	0.974293
Zafar (2000)	Bangladesh (Bay of Bengal)	Combined	-	-1.746	2.8184	0.98
Saker *et.al.*, (2004)	Mumbai	Males	58	-4.154490	2.644086	0.958294
		Females	65	-3.687455	2.459825	0.955420
		Combined	293	-4.744441	2.876643	0.981539
Present study (2011-12)	Ratnagiri	Males	326	-3.8345	2.4873	0.98
		Females	428	-3.7219	2.4363	0.95
		Indeterminants	246	- 4.4411	2.7428	0.94
		Combined	1000	- 4.2569	2.6682	0.97

studied do not indicate any variation in stock of Ratnagiri region. These characters may be useful for similar studies in other geographical areas having different stocks of *M. cordyla.*

The length of specimens studied for length-weight relationship ranged from 152 to 402 mm and weight 30 to 560 gm. The result of study on length-weight relationship obtained for males, females, indeterminants and for total is as follows:

Male: Log W = -3.8345 + 2.4873 Log L
Females: Log W = -3.7219 + 2.4363 Log L
Indeterminate: Log W = - 4.4411 + 2.7428 Log L
Total: Log W = - 4.2569 + 2.6682 Log L (Fig. 1.)

The analysis of covariance indicated that there was no significant difference in the slopes of male, female and indeterminants samples (P> 0.05). The asymptotic length (L_∞) obtained in the present study was 425.3 mm.

The earlier works on length-weight of the species carried out by different investigators from different regions[4,8-10,12] have been compared with present study (Table-2). The results obtained in present investigation appear to be very similar to that of Sivakami[10], and Saker *et al.*,[9].

References:

1. Anon. (2011). Fish Production Report 2010-11. Dept. of Fisheries, Government of Maharashtra, Mumbai. pp. 60.
2. Bal, D. V. and K. V. Rao (1984). *Marine fisheries*, Tata McGraw-Hill, New Delhi, pp. 470.
3. CMFRI, (2010). Annual Report 2009-10. Central Marine Fisheries Research Institute, Cochin, pp. 169.
4. Jaiswar A. K. and P. Acharya (1991). *J. Indian Fish. Assoc., 21:* 45-46.
5. Kuthalingam M. (1959). *J. Madras University 29*(2): 79-96.
6. LeCren E. D. (1951). (*Perca fluviatilis*) *J. Anim. Ecol. 20:* 201-219.
7. Rao K.V., Narayana M.K. and J. Sankarasubramaniam (1977). *Seafood Export J. 9*(8): 1-16.
8. Reuben S., H.M. Kasim, S. Sivakami, P.N.R. Nair, K. N. Kurup, M. Sivadas, A. Noble, K.V.S. Nair and S.G. Raje (1992). *Indian J. Fish. 39* (3,4): 195-234.
9. Saker Y., A. K. Jaiswar, S.K. Chakraborty and R. P. Swamy (2004). *Indian J. Fish. 51* (4): 481-486.
10. Sivakami S. (1995). *J. Mar. Boil. Asso. India* 1995. *37*(1&2): 237-248.
11. Sreenivasan P. (1974). *Indian. J. Fish. 21*(1): 76-84.
12. Zafar M., M.G. Mustafa and M.A. Haque (2000). *Indian J. Fish. 47*(3): 163-168.