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Biometry of the mahseer, *Tor putitora* (Hamilton) collected from Garo Hills, Meghalaya

M DASGUPTA[1]

North-Eastem Hill University, Shillong, Meghalaya 793 014

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There is practically no information on the biology of the mahseers from the North-Eastem India, except that of Dasgupta (1989), on the copper mahseer *Acrossocheilus hexagonolepis* (McClelland). Hence this study was conducted.

Specimens of mahseer, *Tor putitora* (Ham.) were collected every month during August 1978 to July 1980 from river Simsang, situated in the east Garo Hills, Meghalaya (25"30'N,90'40' E; altitude 1138feetabove sea level). Cast nets having mesh sizes 0.5 cm and 1.5 cm were used. Immediately after collection, specimens were fixed in 10% formalin, brought to the laboratory, and detailed measurements, weights and counts were recorded. Exam inationof 286 specimens of 85.0 - 335.0 mm size and 5.68 - 290.0 g weight was done and 31 morphometric and meristic characters, as described by Lowe-Mc Connel (1971), were taken. All linear measurements were rounded to the nearest mm. The number of times each morphometric character went into the reference length of the fish was considered as the biometric index (Tobor 1974). For each charecter, a mean biometric index for every 50.0 mm length group was calculated.

Present address: 'Department of Zoology, Shibpur Dinobundhoo Institution (College), 412/1, G T Road (South), Shibpur, Howrah 711 102.

The regression of various morphometric characters on standard length was obtained by least square method with the formula $Y = a + b X$, where Y, the variable character such as total length, head length etc.; a, the constant value to the determined; b, the regression coefficient; and X, the standard length. The correlation coefficient r of these regressions was computed.

The morphometric characters showed a proportional positive increase with increase in length of the fish. The mean and range of these values are in Table 1. Among the meristic characters the number of dorsal fin rays (4/8), ventral fin rays (9), anal fin rays (3/5), caudal fin rays (19) and transverse scales (4/2) were constant.

Number of pectoral fin rays (17-18) and lateral line scales (25-28) varied independent of length of fish.

The regression coefficient b of different variable characters (Y) on standard length (X) indicated that the rate of growth in respect to standard length was highest in case of fork length (b =. 1.3283) and lowestTn eye diameter (b = 0.0409) (Table 2). High values of correla^ tion coefficient r obtained indicated a high degree of positive correlation of the different morphometric parameters with the reference length (standard length).

Table 1. Morphomelric analysis of *Tor pul'uora*

Parameters	Mean	Range
Standard length (%)		
Total length	131.32	129.65-137.64
Fork length	112.24	111.88-115.32
Predorsal length	52.89	52.07- 56.10
Head length	31.34	29.03- 31.99
Head depth	18.46	17.73- 23.36
Body depth	25.65	24.52- 29.01
Least height of caudal peduncle	11.18	10.22- 13.05
Length of caudal peduncle	17.44	15.45- 18.29
Dorsal fin length	13.74	13.39- 15.17
Free margin of dorsal fin	19.29	17.89- 21.13
Dorsal fin height	24.05	22.83- 28.57
Pectoral fin height	20.24	19.73- 24.85
Ventral fin height	17.83	17.73- 21.87
Anal fin height	21.05	18.92- 23.36
Anal fin base	7.69	6.62- 8.92
Girth	61.87	59.05- 73.36
Head length (%)		
Snout length	32.24	31.81 32.32
Eye diameter	19.03	17.95- 21.95
Post-orbital head length	48.61	44.18 49.46
Inter-orbital length	36.30	32.11- 38.18
Length of upper jaw	25.59	24.87- 27.00
Gape	31.02	30.79- 33.20
Rostral barbel length	24.62	23.26- 26.23
Maxillary barbel length	25.73	23.42- 27.48

Table 2. Regression equations of morphometric parameters of *Tor pulitora*

Parameters	Regression equation	Correlation coefficient
Total length (Y) on standard length (X)	Y = 7.8493+1.2559 X	0.9994
Fork length (Y) on standard Length X	Y = 35.3946+1.4643 X	0.9781
Predorsal length (Y) on standard length (X)	Y = 2.0832 + 0.5278 X	0.9994
Head length (Y) on standard length (X)	Y = 2.5112 +0.2787 X	0.9983
Snout length (Y) on standard length (X)	Y = -0.9645 + 0.2477 X	0.4033
Eye diameter (Y) on standard length (X)	Y = 2.6924 + 0.0409 X	0.9933
Inter-orbital distance (Y) on standard length (X)	Y = 1.5151 + 0.9935 X	0.9935
Gape (Y) on standard length (X)	Y = 0.8394 +0.1007 X	0.9351
Rostral barbel length (Y) on standard length (X)	Y = 2.2731 + 0.0615 X	0.9996
Head depth (Y) on standard length (X)	Y = 4.5772 +0.1622 X	0.9972
Body depth (Y) on standard length (X)	Y = 10.0129 +0.2134 X	0.9501
Length of caudal peduncle (Y) on standard length (X)	Y = -1.5977 +0.1825 X	0.9837
Dorsal fin length (Y) on standard length (X)	Y = 1.8418 +0.1298 X	0.9881
Dorsal fin height (Y) on standard length (X)	Y = 2.6880 + 0.2458 X	0.9976
Pectoral fin height (Y) on standard length (X)	Y = 5.6000 +0.1678 X	0.9964
Anal fin height (Y) on standard length (X)	Y = 5.3555 +0.1608 X	0.9933
Anal fin base (Y) on standard length (X)	Y = 2.5068 + 0.0534 X	0.9699
Girth (Y) on standard length (X)	Y = 11.9981 + 0.5794 X	0.9975

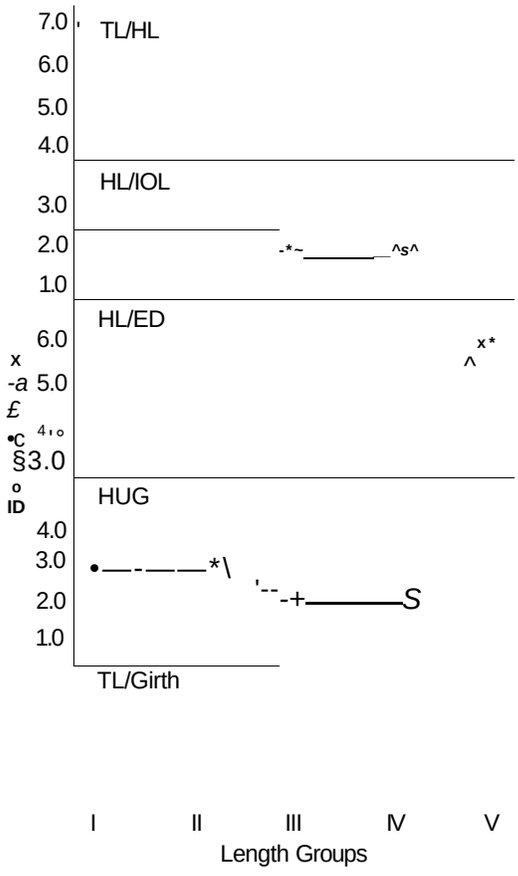

Fig. 1. Biometric indices of *Tor putitora* at different length groups. TL, Total length; HL, head length; IOL, inter-orbital length; ED, eye diameter, G, Gape

Biometric index of *T. putitora* (Fig. 1) showed that the eye diameter (ED) became progressively smaller in relation to head length (HL). Similar observations were made by Tobor (1974) in *Lates niloticus* and by Dasgupta (1989) in *Acrossocheilus hexagonolepis*. The growth of girth in relation to total legth (TL) was isometric. According to Bayagbona (1963) a constant index in any of the biometric characters in relation to its reference length is isometric. The growth of head length in relation to total length and growth of inter-orbital distance (IOL) and gape (G) in relation to head length was allometric showing wide variations

The morphometric ratios and meristic counts in *T. putitora* observed in this study were similar to those recorded by Hora (1939). According to Gould (1966), ratios between morphological characters of fish will not necessarily be constant for the organisms of the same species due to variations resulting from difference in sex, race and nutrition and/or other environmental factors.

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