

Note

Morphometry, length-weight relationship and relative condition factor of *Osteogeneiosus militaris* (Linnaeus, 1758) from Mumbai waters, India

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Abstract

The morphometric study on the soldier catfish, *Osteogeneiosus militaris* from Mumbai waters indicated high degree of correlation among the compared characters. Based on the meristic study the fin formula can be written as: D I,7 ; P I, 10-11; V 6; A 18-22, C 17-19. The length-weight relationship was worked out as $W = 0.000006 L^{3.05}$ for females, $W = 0.000008 L^{3.01}$ for males and $W = 0.000007 L^{3.03}$ for pooled. The seasonal variation observed in the condition factor for both the sexes could be related to reproductive cycle and feeding intensity.

The soldier catfish, *Osteogeneiosus militaris* (Linnaeus, 1758) belonging to family Tachysuridae contributes to around 18% of the total marine catfish landings at Mumbai (Anon, 1991-2002). Studies of morphological variation among fish population continue to play an important role in stock identification, despite the advent of biochemical and molecular genetic techniques. The length-weight relationship also is important from the point of stock assessment. Similarly, the condition factor, a reliable indicator of the energy reserves in fish is usually associated with feeding intensity, reproductive cycle and and/or adverse environment conditions. Since there is no report on these aspects on *O. militaris* from Mumbai waters, a study was undertaken and the results are presented.

Materials and methods

A total of 405 fishes ranging between 154-408 mm (TL) and 30-590 g (wt.) collected at weekly intervals from New Ferry Wharf and Sassoon Dock landing centres at Mumbai from September 2002 to August 2004 were studied. Standard procedure adopted by Dwivedi (1974) and Menezes (1974) was followed to study morphometric features. Relationship among the various morphometric parameters was worked out using standard linear regression analysis technique. The meristic characters studied are the number of rays on pectoral, dorsal, ventral, anal and caudal fins. Meristic characters were subjected to standard statistical analysis including range, mean, mode, median, standard deviation, standard error and sample variance.

The length-weight relationship ($W = a L^b$) was calculated separately for male and female following Le Cren (1951). ANACOVA as per Snedecor and Cochran (1961)

was considered to test the significance of difference in b values in male and female. Condition factor was established using the formula given by Le Cren (1951),

Results and discussion

The coefficient of correlation of total length against other morphometric characters ranged from 0.808 to 0.995 and head length with characters in head ranged from 0.801 to 0.974. The statistical analysis like range, correlation coefficient and standard error of estimate of various morphometric characters and their relationship to total length and head length were also determined. The relationship between total length and fork length was found to be $Y = -8.61 + 0.947 X$, total length and standard length $Y = -4.43 + 0.875 X$, total length and pre-dorsal length $Y = -11.07 + 0.361 X$, total length and pre-pectoral length $Y = -10.86 + 0.248 X$, total length and pre-ventral length $Y = -9.181 + 0.467 X$, total length and pre-anal length $Y = -12.16 + 0.636 X$ and so on and the relationship between Head length and snout length is $Y = 4.877 + 0.247 X$, and head length and eye diameter $Y = 4.27 + 0.073 X$. A comparison of the meristic characters reported earlier and during the present study also has been made (Table 1)

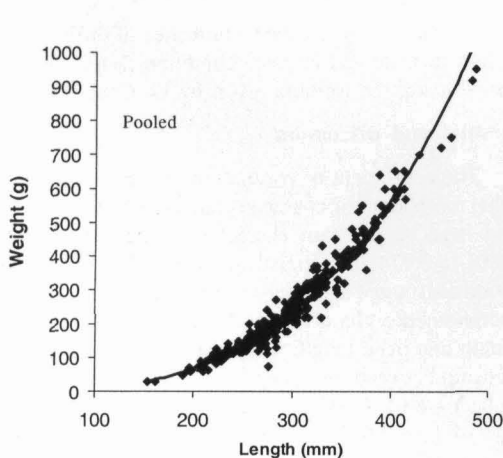
The length-weight relationship for female, male and the pooled were found to be

$W = 0.000006 L^{3.05}$ ($r^2 = 0.981$), $W = 0.000008 L^{3.01}$ ($r^2 = 0.962$) and $W = 0.000007 L^{3.03}$ ($r^2 = 0.977$) respectively. No significant difference in 'b' values between sexes at 5% level was found (Fig. 1).

The ponderal index (K) indicated high value in March (1.049) for males and May (1.08) for females. The minimum value was observed during October (0.95) for

Table 1. Comparison of meristic counts of *O. militaris* reported by other investigators

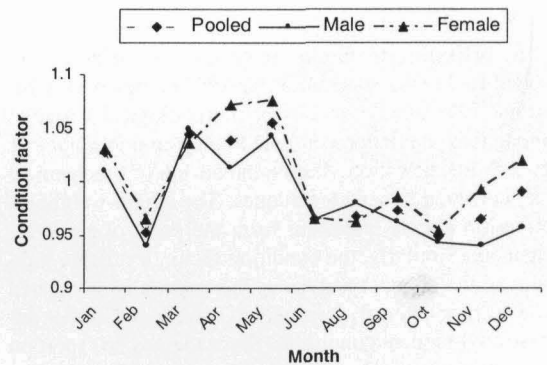
Authors	Dorsal fin rays	Anal fin rays	Pectoral fin rays	Pelvic fin rays	Caudal fin rays	Place
Day (1878)	I, 7	19-22	I, 10-11	6	17	India
Talwar & Kacker (1984)	7	19-22	10-11	-	-	India
FAO (1984)	I, 7	19-22	-	6	-	India
Munro (1955)	I, 7	19-21	9-10	-	-	Ceylon
Talwar & Jhingran (1991)	I, 7	19-22	I, 10-11	6	-	India
Present study	I, 7	18-22	I, 10-11	6	17-19	India (Mumbai)

Fig.1. Length-weight relationship of *O. militaris* from Mumbai waters

female and February (0.94) for male (Fig. 2). This behaviour may be the result of protracted spawning which extended from February to October.

References

- Anon, 1991-2002. Annual Reports, Central Marine Fisheries Research Institute, Cochin. 1991-2002.
- Day, F. 1878. The fishes of India, Vol. 1.2, Reprinted 1958, William Dawson and sons. Ltd. London. P. 210 - 215.
- Dwivedi, S. N. and M. R. Menezes. 1974. *Geobios*, 1: 80-83.
- FAO. 1984. *Species identification sheet for fishery purposes*

Fig.2 Monthwise condition factor in *O. militaris* from Mumbai waters

Western Indian Ocean. Food and Agricultural Organization of the United Nations, Rome.

- Hile, R. 1936. *U. S. Bur. Fish. Bull.*, 48: 211-317.
- Le Cren, C. D. 1951. *J. Anim. Ecol.*, 20 : 201-219.
- Munro, I. S. R. 1955. *The marine and fresh water fishes of Ceylon*. Canberra, Australia.
- Snedecor, G. W. and G. Cochran. 1967. *Statistical methods*. Sixth edition. Oxford and IBH publication Co., New Delhi, 593 pp.
- Talwar, P. K. and A. G. Jhingran. 1991. *Inland fishes of India and adjacent countries*. Oxford & IBH Publishing co. Pvt. Ltd. 711 pp.
- and R. K. Kacker. 1984. *Commercial sea fishes of India*. Vol. I. Zoological Survey of India. 275 pp.

Accepted: 14 July 2005