

A NOTE ON THE MORPHOMETRY AND ECOLOGY OF *BRACHIRUS ORIENTALIS* (BLOCH AND SCHNEIDER) IN THE ESTUARIES OF GOA\*

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SUMMARY

The metric and meristic characters of *Brachirus orientalis* from Mandovi and Zuari estuaries of Goa obtained by trawl net catches during the year 1972-73 have been studied. In addition, the distribution in relation to environmental parameters has been discussed.

INTRODUCTION

The flat-fish, *Brachirus orientalis* (Bloch and Schneider) under the family (Solidae=Pleuronectidae) is known to occur from the Persian Gulf, through the Malay Peninsula to China and Australia and is widely distributed along the Indian coasts (Day, 1878, Pradhan 1964, Norman 1928, Misra 1943, Munro, 1955). Around Goa, it is sometimes caught in beam trawls in the nearshore region and in the estuaries, but there is no exclusive fishery for this species. During 1972-73 a total of twenty five hauls of trawl nets were operated in the Mandovi and Zuari estuaries of Goa (Fig. 1). Amongst these

distribution and sex ratios of *B. orientalis* along with some environmental parameters (Table 1) of which

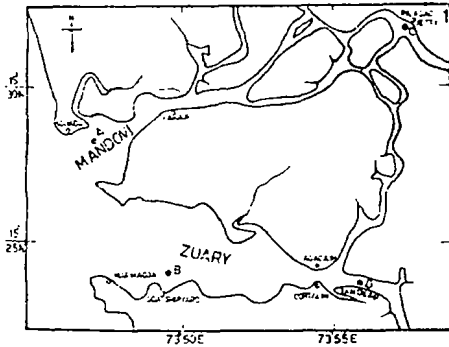


Fig 1 Sampling stations A,B,C,D in Mandovi and Zuari estuaries.

in 8 hauls 90 specimens of *B. orientalis* were caught. Generally, this species occurred in the middle reaches of both the estuaries. The present communication deals with the morphometry, length frequency,

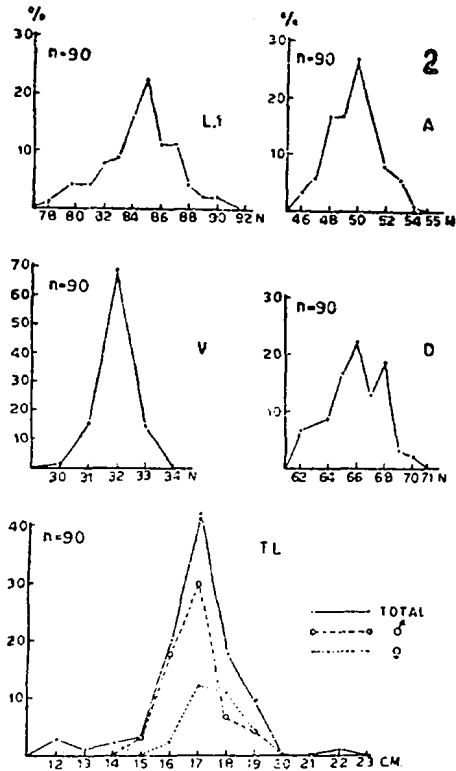


Fig. 2 *B. orientalis*—Frequency polygons for number of lateral line scales (L. 1) Vertebrae (V), Dorsal (D) and Anal (A) fin rays and length frequency (TL).

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very little is hitherto known. The following are some of the synonyms : *Pleuronectes orientalis*, Bloch & Schneider *Synaptura orientalis* Day, *Solea foliacea* Richardson, *S. pan* Bleeker, *S. foliacea* Gunther, *Brachirus sundaicus* Bleeker and *Synaptura nigra* Macleay.

*Environmental features* : The catches (Table 1) seem to be influenced in general by the changing tidal condition as more specimens were obtained at high tide. Slight variations in salinity and temperature

*Morphological characters* : Amongst the metric characters, standard length, head length, diameter of eyes, height of body, length of head and thickness of body were studied. The linear measurements have been expressed as indices with reference to total length. The index for diameter of the eye has been given (Fig. 3) with reference to head length (Kesteven, 1960).

The depth of the body and the length of heads show allometric growth. Their regression on total length has

Table 1. Trawling stations, environmental features and other parameters from where *B. orientalis* collections were made.

Date of collection	Station No.	Time	Tide	No. of specimens	Sex Ratio		Secchi disc in m.	Depth in m.	Temperature °C		Salinity ‰	
					Female	Male			S	B	S	B
6.2.73	B	0930	LT	14	1	2.80	0.75	7.5	26.5	26.0	24.65	35.12
30.4.73	C	1120	HT	16	1	1.28	1.55	3.0	32.2	31.4	25.50	28.45
14.5.73	A	1035	HT	7	1	1.33	1.54	4.0	30.3	30.0	—	—
27.7.73	B	0915	HT	23	1	2.28	0.65	10.0	27.2	27.0	20.07	—
	C	1430	HT					3.0	28.2	—	18.01	—
31.7.73	A	1120	LT	7	1	1.33	0.77	5.0	28.5	28.2	17.07	23.82
25.8.73	D	0930	HT	6	1	5.00	0.66	4.0	26.5	25.5	1.76	29.31
8.8.73	C	1430	HT	17	1	0.88	1.45	3.0	—	26.0	—	25.90

S=Surface; B=Bottom; HT=High tide; LT=Low tide

seem to have no effect on the abundance of fish. The highest catch was obtained at 10 m depth.

*Length frequency* : The length range of the specimens collected was from 12 to 22 cm. The males were 14 to 20 cm. and females were 12 to 22 cm. of total length and both had a single mode at 17 cm. The sex ratio of females to males with overall sample was 1 : 1.8 but females were comparatively more abundant in smaller size groups (Fig. 2).

been studied (Fig. 4). The height of body grows faster ( $b=0.85$ ) than the head ( $b=0.51$ ) thus the older specimens look comparatively wider than the younger ones.

*Meristic characters* : Amongst the meristic characters, number of lateral line scales, vertebrae and rays of dorsal, anal, pectoral and pelvic fins have been studied, and their mean values and variation are given in Table 2.

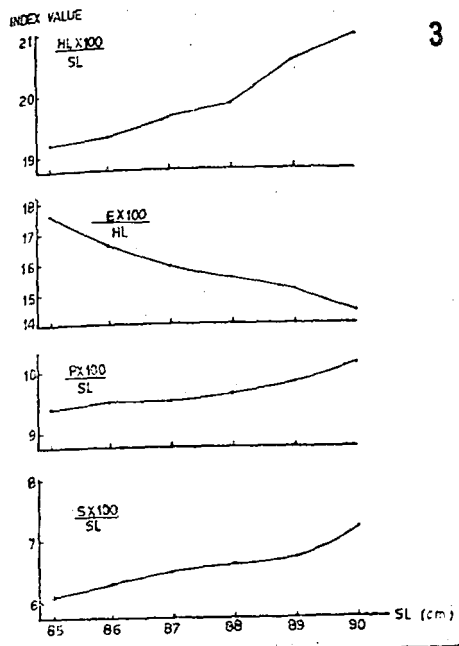


Fig. 3 *B. orientalis*—Index value for head length (HL), diameter of eyes (E), peduncle depth (P) and snout length (S) in reference to standard length (SL).

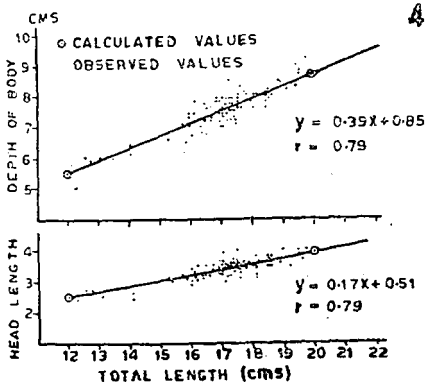


Fig. 4 *B. orientalis*—Regression of head length and depth of body on total length.

Table 2. Variations of meristic characters in *B. orientalis*

Characters	No.	Range	Mode	Mean Stand-ard error*	Co-efficient of variation (CV)
Vertebrae	90	30-33	32	31.96 ± 0.12	1.84
Lateral line scales	90	78-91	85	84.49 ± 0.55	3.09
Fin Rays :					
Dorsal	90	62-70	66	65.66 ± 0.41	3.00
Anal	90	46-54	50	49.73 ± 0.36	3.60

\*0.95 level of confidence

The number of pectoral and ventral fin rays were 7 and 5 respectively and they did not show any variation amongst the specimens studied. From the coefficient of variations in respect to several meristic characters given in Table 2, it may be seen that the number of scales vary considerably, but the number of vertebrae is a stable character. The co-efficient of variation is 1.84 (Simpson et al., 1969). This can help in characterising the species and in studying the localised populations, if any.

The fin formula as given by earlier authors and that found in the present study is given in Table 3.

Table 3. Fin formula in *B. orientalis*.

Authors	Fin rays				Lateral line scales	Verte-brae
	N. Dorsal	Anal	Pecto-ral	Vent-ral		
Day 1878	—	62-65	47-50	7	5	70-85
Munro 1955	—	62-75	47-57	—	—	63-74
Present study	90	62-70	46-54	7	5	78-91 30.33

Colouration : The colouration is greyish or brownish, blotched or spotted with a number of dark vertical streaks crossing the lateral line. The right pectoral is dusky. One specimen of *B. orientalis* was found

having patchy pigmentation on the blind side towards the edges which extended to the dorsal and anal fin rays. Pigmentation on the blind side of the flat fishes has been regarded as an abnormality and the specimens are said to be 'ambicolourate'. Amongst the Indian flat fishes ambicolouration has been recorded in *Brachirus pan* (Hamilton) by Jones and Menon (1950), *B. orientalis* by Pradhan and Pradhan (1962) and in *Cynoglossus semifaciatus* by Seshappa (1970). According to Norman (1934) in partial ambicolouration no other variation in the structure of the fish is noticeable, but in cases of complete ambicolouration there are always other variations in the line of asymmetry, these variations being associated with the scales also. In *C. semifaciatus* even partial ambicolouration and partial albinism are associated with other changes such as development of an extra portion of the sensory canal system or the disappearance of part of the existing one (Seshappa, 1970). In the present study, pigmentation is of the nature of spotting only. The length of the ambicoloured specimen was 21.1 cm the head length

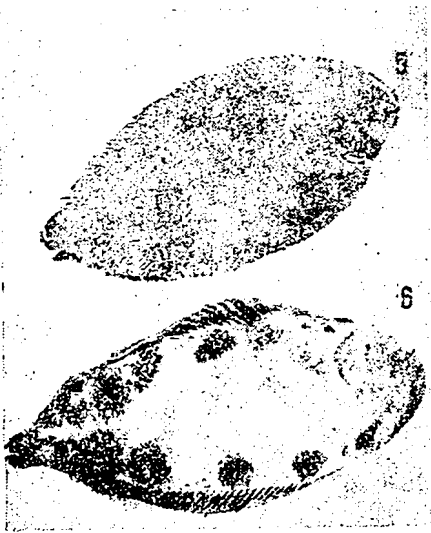


Fig. 5 *B. orientalis*—View of the specimen from the coloured side, Fig. 6 *B. orientalis*—View of the ambicolourate specimen from blind side.

4.1 cm and the width of the body 8.9 cm. The counts were D64 A48 P7 V5 L 1.83 Vert. 32 (Figs 5-6).

On the evidence of the available data, Norman (1934) feels that the ambicolouration perhaps merely represents variation in the direction of the originally bilaterally symmetrical condition of the ancestors of the flat fishes. It has been suggested that all these abnormalities may only be the result of aberration of genetic factors (Seshappa, 1970).

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