

A NOTE ON MORPHOMETRIC AND LENGTH-WEIGHT RELATIONSHIP
OF *UPENEUS MOLUCCENSIS* (BLEEKER) OFF VERAVAL COAST.

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ABSTRACT

The fishes were collected from the catches of bottom fish trawl of "M. V. Saraswati" of Veraval coast in the area Lat. 20°26 'N and Long. 70°35 'E. The fishes were analysed for length weight relationship and morphometric characters. The fishes were found to vary from 116 to 161 mm in length and 20.0 to 50.0 g in weight. The exponent value and correlation coefficient for length-weight relationship was found to be 2.73 and 0.991 respectively.

Variable meristic characters were lateral line scales, gill rakers and pectoral fins. The dorsal fins, ventral fin and anal fin did not show variations in their count. The metric characters were also compared to the total length.

INTRODUCTION

Upeneus moluccensis belongs to family Mullidae. The presence of two barbels on the chin and a golden yellow strip as broad as pupil, passes from eye along the upper side of the body to the upper caudal base, 2 bands on the dorsal fin and 5 transeverse oblique on the upper caudal fin. are the peculiar characteristics of this species. It is interesting to note that strip was orange in colour, when the fishes were brought by the net on the deck and within three minutes the dark orange colour was changed into golden bright yellow. The pectoral, ventral and anal fins were devoid of any bands.

Thomas (1969) found no record of this species from the east coast of India. However, some work has been carried out on the taxonomy and morphometry of *Upeneus moluccensis* (Bleeker). The important contributions are those of Weber and De Beaufort (1931). Fowler (1933), Lackner (1954) and Sithamparam and Dwivedi (1982).

These fishes live in shallow water and are bottom dwellers. The flesh of goat fishes is of good quality. The goat fishes catch reported from fishery area 51 H exceeded 65000 tons in 1980 of which more than 55000 tonnes corresponded to species of *Upeneus* (FAO, 1984).

MATERIAL AND METHOD

A total of 190 specimens were collected, from the catches of bottom fish trawl of M. V. "Saraswati". Morphometric characters were measured and weight of the individual specimen was taken.

The length-weight relationship was calculated using the equation " $W=aL^b$ " and its logarithmic form $\text{Log } W=a+b \log L$, where " W " is the weight " L " is the length, " a " and " b " are constant values obtained by the least square method (Snedecor, 1991).

The data for morphometric characters were utilised following the methodology described by Snedecor (1961) and adopted by Dwivedi & Menezes (1974).

RESULTS AND DISCUSSION

The fishes were found varying 116 to 161 mm in length and their weight was found to vary from 20.0 to 40.0 g. All fishes were grouped in 5 mm length intervals.

A straight line was obtained when the log values for length and weight were plotted on graph (Fig. 1). The equation obtained is expressed as follows

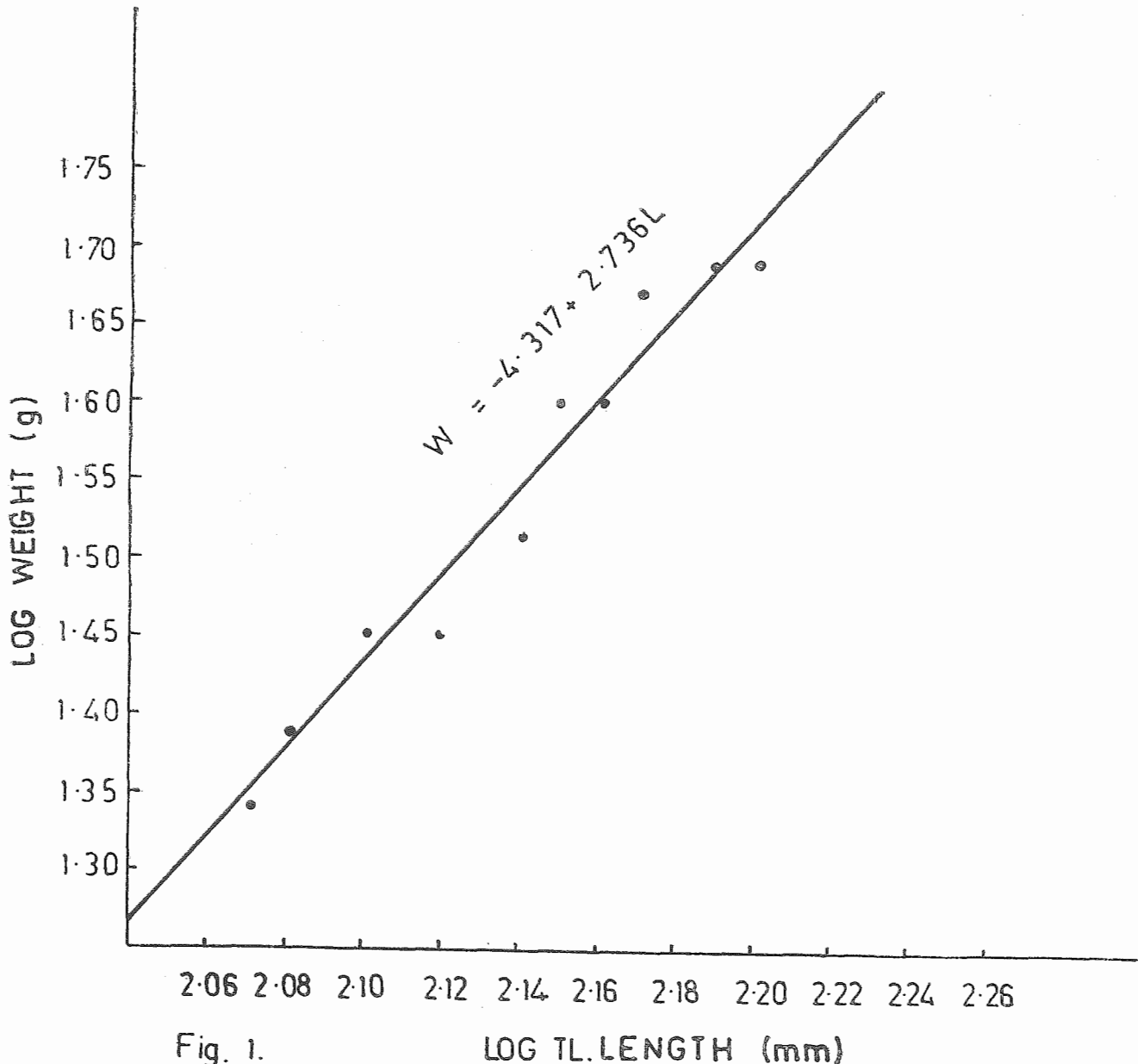


Fig. 1.

LOG TL. LENGTH (mm)

Fig 1. Length-weight relationship of *Upeneus moluccensis* (Bleeker)

$\text{Log } W=a+b \log L$ $\text{Log } W=4.317+2.736 \log L$ or $W=0.000004816 L^{2.736}$.

The exponent value was found less than three. In order to see whether the regression coefficient differed from three, student 't' test was applied. The 't' value was found to be 3.139 (d.f. 189 $t=1\% =2.537$, $t 5\% =1.96$), which indicate that the regression coefficient was significantly different from three.

MORPHOLOGICAL CHARACTERS

The characters like standard length, per-ventral length, pre-pectral length, pre-anal length, pre-dorsal (1st and 11nd) length, maximum depth & minimum depth of the body. Head length, were measured and compared to the total length separately. A straight line was produced of each comparison (Fig. 2), which indicate the allometric relationship to the total length.

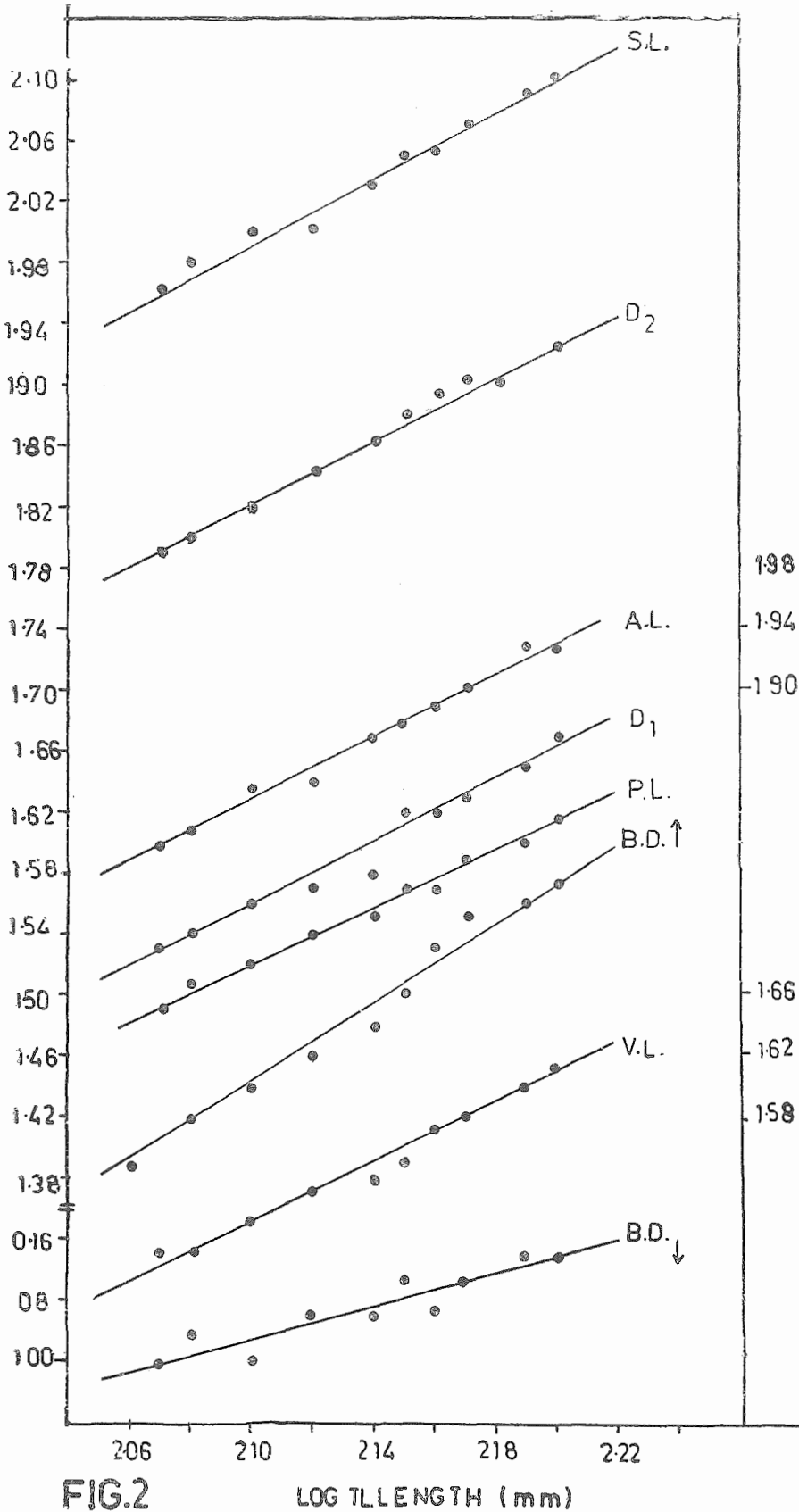


Fig. 2. Scatter diagram showing the relationship between metric characters and total length of *U. moluccensis*

A linear relationship was obtained for head length in comparison to different parts of the head region, like snout length, snout width; inter orbital space, post orbital length and diameter of the eye. The results are represented in table 1. and illustrated in Fig. 3.

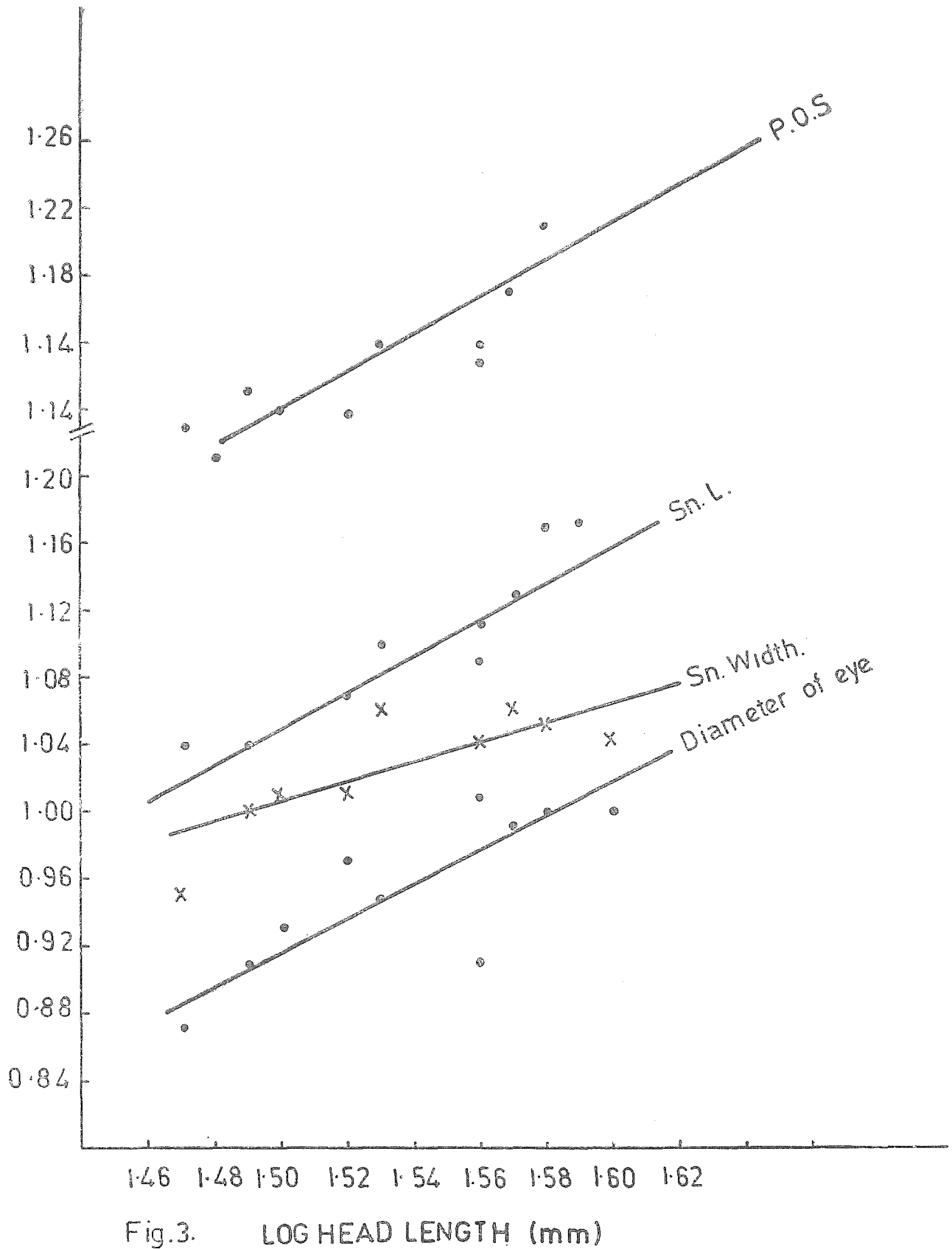


Fig. 3. Scatter diagram showing the relationship between metric characters of Head region and total head length.

The counts were made for Dorsal, Ventral, Anal and Pectoral fin rays, number of gill rakers on the first gill arch of the left side and number of lateral line scales. Maximum variation was observed in the case of lateral line scales which ranges from 33 to 38. However, number of gill rakers ranges from 20 to 25 and pectoral fin rays from 15 to 17. their mode, mean, standard deviation, standard error, variance and coefficient variance and represented in table 2.

The counts for Dorsal (Ist and IInd), Ventral and Anal fins were found 8/1-8, 1,5 and 1,6 respectively. Similar results were also recorded by Fowler, 1933, Lackner, 1954, and Weber & De Befault, 1931.

Upeneus moluccensis may be differentiated to the other related species like, *Upeneoids fassiatatus* (Day), *Upenoides sulphureus* (Day) and *Upeneus vittatus* (Bleeker). The brilliant-yellow stripe as wide as pupil of the eye (*Upeneus moluccensis*) and broad as two third of a scale (*Upenoides fassiatatus*), the addition 2-3 more stripe below and parallel to the first stripe (*Upenoides sulphureus*). Four or five oblique bands on the caudial lobe (*Upeneus moluccensis*) and on both lobes of the caudal fin (*Upeneus vittatus*).

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ABBREVIATION

Standard length (S. L), First Dorsal length (D1); Second dorsal length (D2); Anal length (A.L.); Pectoral length (P.L); Body depth through dorsal fin (B.D./) Body depth through caudal peduncle (B.D./); Ventral length (V.L.); Post orbital length (P.O.S); Snout length (Sn L), Snout width (Sn. width).

REFERENCES

1. Dwivedi, S. N., & M. R. Menezes., (1974). A note on the morphometry and ecology of *Brachios orientis* (Black & Schenider) in the estuary of Goa. *Geobios.* 1 : 80-83.
2. FAO. (1984). Species identification sheets for fishery purposes-Western Indian Ocean. Food and Agriculture Organisation of the United States: Rome.

3. Fowler, H. W. (1983). Contribution to the biology of the Philippine Archipelago and adjacent regional; *U. S. Nat Mus. Bull* No. : 100, 12: 328-329.
4. Lancher, E. A. (1954). A revision of the goat fish genus *Upeneus* with description of two new species; *Proc. U. S. Nat Mus.* 103 : 497-532.
5. Le Cren, C. D. (1951). The length-weight relationship and seasonal cycle in gonad weight and condition in the perch (*Perca fluviatilis*). *J. Animal Biol.* 20 : 202-219.
6. Sithamparam, S. and S. N. Dwivedi, (1982). Morphometry of *Upeneus moluccensis* (Bleeker) found along the Bombay coast. *Proc. Indian Natn. Sci. Acad* : B48 : 623-627.
7. Snedecore, G. W (1961). Statistical methods applied to experiments in Agriculture and Biology (Indian ed.) *Alludpacific private Ltd.*, Bombay, 534.
8. Thomas P, A, (1969) The Goat fishes (Family Mullidae) of the Indian Seas 33 memoir III, Marine Biological Association of India, p-17.
9. Weber, M and L. F. De Beanfort, (1931). The fishes of the Indo-Australian Archipelago : Vol 6 : 362-363, 367-369.

“a”, “b” and “r” values of various morphometric characters compared with total length

Characters			
Compared with total length	a	b	r
Standard length	-0.0603	+0.9783	0.9943
Pre-dorsal length (Ist)	-0.5166	+0.9901	0.9962
Pre-dorsal length (IIInd)	-0.2803	+1.0016	0.9953
Pre-ventral length	-0.4505	+0.9343	0.9875
Pre-pectoral length	-0.4054	+0.9183	0.9926
Pre-anal length	-0.2457	+0.9889	0.9874
Maximum depth	-1.3748	+1.3405	0.9927
Minimum depth	-1.2880	+1.1053	0.9216
Head length			
Compared with Head length	-0.3897	+0.9022	0.9929
Snout length	-0.5871	+1.0974	0.9503
Snout width	-0.7336	+1.1544	0.8479
Inter orbital space	-0.0663	+0.6323	0.5048
Post orbital length	-0.5129	+1.0713	0.9217
Diameter of eye	-0.3596	+0.8553	0.7284

Details of variable meristic characters

Character	Range	Mode	Mean	Standard Deviation	Standard error	Variance	Coefficient variance
Lateral line N=190	33-38	35	34.95	1.194	0.086	1.426	3.41
Gill racker N=190	20-25	22	22.51	0.097	0.072	0.994	4.43
Pectoral fin N=190	15-17	16	15.91	0.509	0.018	0.259	3.19