

Morphometry of *Upeneus moluccensis* (Bleeker) found along the Bombay Coast

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A study of the morphometric characters of *Upeneus moluccensis* obtained by trawl catches along the coast of Bombay was undertaken during February-April 1982. A comparison of these characters indicated an allometric growth pattern. Variation in colours, as described by Day (1868, 1878) in *Upeneoides fasciolatus* Day and *Upeneoides sulphureus* Day, both considered as synonyms of *Upeneus moluccensis* (Bleeker), has been discussed.

Key Words: *Upeneus moluccensis*, Morphometry, Bombay, Allometric growth

Introduction

The goldband goatfish, *Upeneus moluccensis* (Bleeker), is readily recognised by the presence of two long barbels and a bright-yellow median horizontal stripe on its side extending from eye to caudal peduncle along with the presence of oblique reddish-brown bands on the upper lobe of the caudal fin, the lower lobe being devoid of such bands. Inhabitants of bottom inshore coastal waters, these are mainly caught by trawl nets. *U. moluccensis* has a wide distribution, extending from the eastern Mediterranean to the northern coast of Australia but is said to be rare around isolated groups of islands (Anonymous 1974). Gottlieb (1957) studied the age and growth of

U. moluccensis and Gilat (1962) worked on its biology and population dynamics in the eastern Mediterranean.

Fowler (1933) and Lachner (1954) considered *Upeneoides fasciolatus* Day (1868, type locality Madras) and *Upeneoides sulphureus* Day (1878, in part) to be synonyms of *U. moluccensis*. In addition, there is no subsequent record of this species from the coast of India (Thomas 1969). Though some aspects of the taxonomy and morphometry of this species have been worked by Weber and De Beaufort (1931), Fowler (1933) and Lachner (1954), there is, at present, no precise information regarding this species from the coast of India. The

present study was undertaken to help in the identification of this species along the coast of Bombay.

Materials and Methods

In the present study, the specimens were examined with reference to the FAO species identification sheets and found to be *U. moluccensis* (Bleeker), (figure 1). Their general description also corresponded to that given by Weber and De Beaufort (1931), Fowler (1933) and Lachner (1954, 1960).

A total of 250 specimens was collected during February-April 1982 from Sasoon Docks, Bombay. The standard procedure as adopted by Dwivedi and Menezes (1974) was used for the study of metric and meristic characters.

Results

Morphological characters : Length of specimens ranged from 118–202 mm and weight from 21.2–118.3 g. The regression of standard length (figure 2a), head length (figure 2 b) and body depth (figure 2c) on total length was also studied. The coefficient of correlation (r), for standard length was 0.9999, head length 0.9998 and body depth 0.9993, showing a high degree of correlation.

From the data obtained, it can be inferred that these characters show an allometric growth. The standard length ($b=0.8154$) increases much faster than the head length ($b=0.2563$) and body depth ($b=0.2269$). This, probably, explains the rather elongated and somewhat compressed body of this species. The length of the barbels is between 47 and 57% of the head length (table 1). This closely corresponds to that given by Lachner (1960) which was between 46 and 66%. The length-weight relationship also shows an allometric growth (figure 3).

Meristic characters: Amongst the meristic characters, the number of lateral line scales, the spines of the first dorsal and rays of the second dorsal, pectoral, ventral and anal fins was studied. The percentage distribution of these characters is given in figure 4. The range, mode, mean \pm SE and coefficient of variation are given in table 2. A comparison of the meristic characters as given by earlier authors is given in table 3. The number of spines in the first dorsal and rays in the ventral fins is 8 and 6 respectively, which is quite constant. The number of pectoral fin rays varies from 15–18.

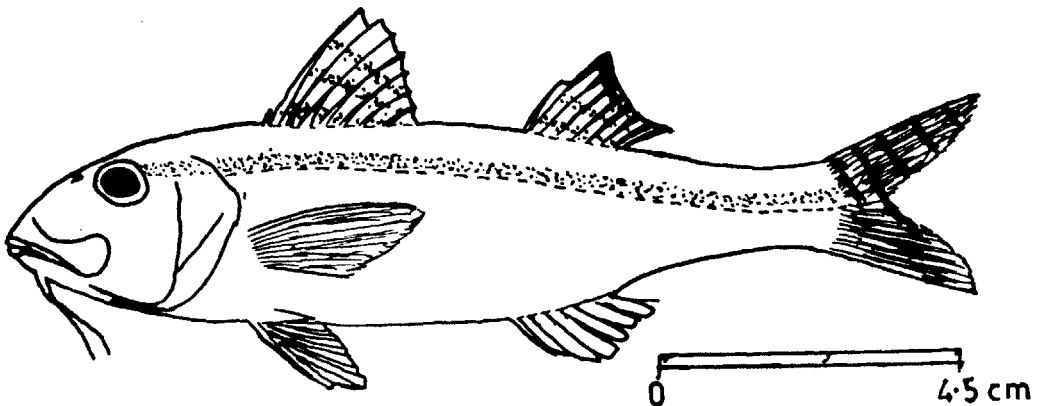


Figure 1 *Upeneus moluccensis*

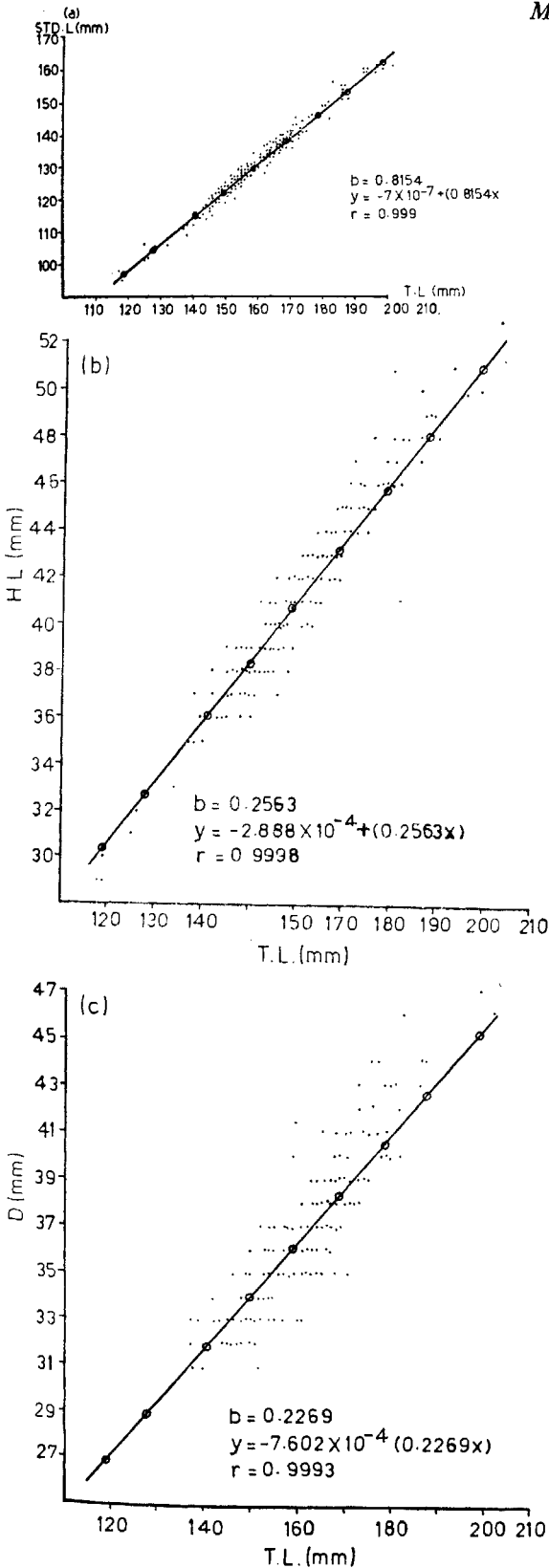


Table 1 Barbel length in percent of head length in *Upeneus moluccensis* according to size group

| Total length (mm) | Barbel length in percent head length | | | | | |
|-------------------|--------------------------------------|-------|-------|-------|-------|-------|
| | 47-48 | 49-50 | 51-52 | 53-54 | 55-56 | 57-58 |
| 115-124 | — | — | 3 | — | — | — |
| 125-134 | — | 6 | — | — | — | — |
| 135-144 | 12 | — | — | — | — | — |
| 145-154 | — | 78 | — | — | — | — |
| 155-164 | — | 64 | — | — | — | — |
| 165-174 | — | — | 60 | — | — | — |
| 175-184 | — | — | — | 12 | — | — |
| 185-194 | — | — | — | — | — | 8 |
| 195-204 | — | — | — | — | 3 | — |

Table 2 Variation in meristic characters in *Upeneus moluccensis*

| Characters | Range | Mode | Mean \pm SE* | Coefficient of variation |
|---------------------|-------|------|------------------|--------------------------|
| Lateral line scales | 35-39 | 38 | 37.15 \pm 0.15 | 2.81 |
| Second dorsal rays | 6-9 | 8 | 7.96 \pm 0.03 | 3.24 |
| Anal rays | 5-7 | 6 | 5.99 \pm 0.19 | 2.59 |
| Pectoral rays | 15-18 | 16 | 16.04 \pm 0.08 | 4.15 |

*95% level of confidence

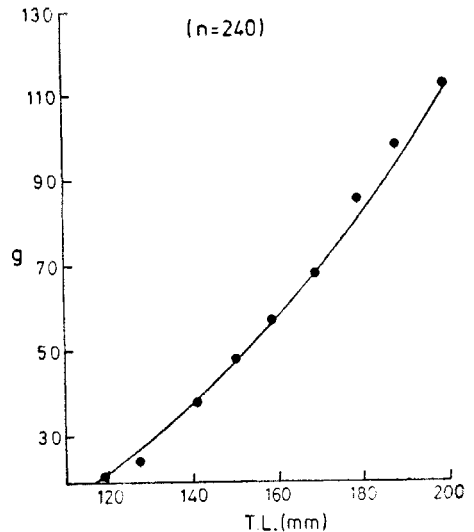


Figure 3 Average weight (g) in relation to total length (T.L.) in *Upeneus moluccensis*

Figure 2 a-c Regression of standard length (a), head length; (b), body depth and (c), total length (T.L.) in *Upeneus moluccensis*

Table 3 Meristic characters in *Upeneus moluccensis*

| Author | 1st Dorsal fin | 2nd Dorsal fin | Pectoral fin | Ventral fin | Anal fin | Lateral line scales |
|----------------------------|----------------|----------------|--------------|-------------|----------|---------------------|
| Fowler H W (1933) | VIII | I,8 | — | — | II,6 | 34-35(+3) |
| Gunther A (1859) | VII | I,8 | — | — | 8 | 38-39 |
| Lachner E A (1954) | VIII | I,8 | 15-18 | — | — | 33-36 |
| Weber & De Beaufort (1931) | VIII | I,8 | — | — | I,6 | 34 (+2) |
| Present study | VIII | I,6-9 | 15-18 | I,5 | I,5-7 | 35-39 |

The meristic characters of the first dorsal, ventral and pectoral fins correspond to those given by earlier authors. However, the number of lateral line scales varies when compared with that reported by the above-mentioned authors. This may be due to the different methods employed in counting; for example Fowler (1933) gave the number of scales at the base of the caudal fin separately and when these were added it generally agreed with the range in the present study. It is quite evident that the characters of the first dorsal and ventral fins are quite stable, which could be used in characterizing the localised population.

Discussion

In his description of *Upeneoides fasciolatus*, Day gave the fin formula as D.7/1/7 P.15 V.1/5 A.2/5 C.15 L.1.36 L. tr. 2 1/2/6. In addition, he stated that there is a brilliant-yellow stripe, two-third as wide as a scale, passing from the orbit to the upper third of the tail. The caudal fin is tipped with black is without bands edged white externally. The two dorsal fins are separated by six rows of scales. The first dorsal fin was described to be milky white, edged with black with two horizontal yellow lines along it, which are dotted finely. The second dorsal fin was described to be milky white, edged with black having one

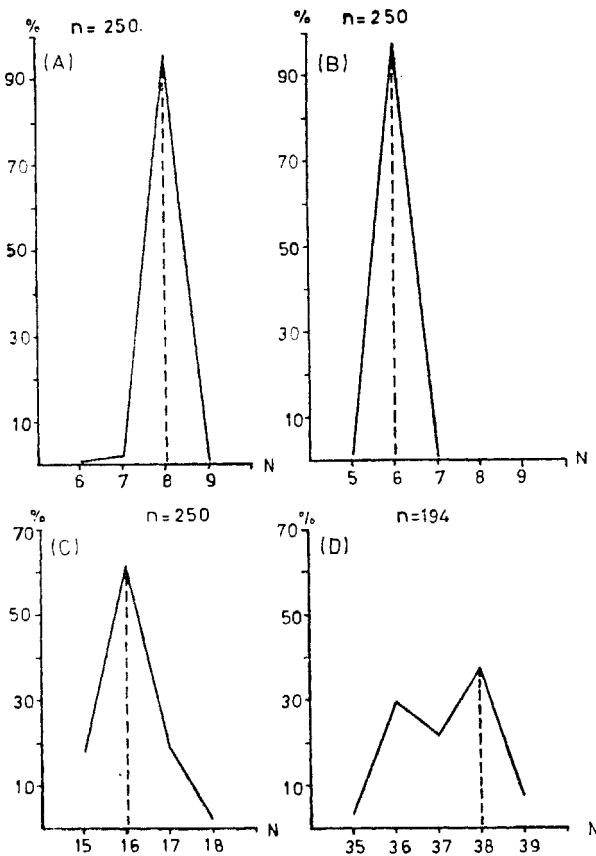


Figure 4 A-D Frequency polygons for the number of **A**, second dorsal fin rays; **B**, anal fin rays; **C**, pectoral fin rays and **D**, lateral line scales

curved horizontal yellow line with black points running along its centre.

In *Upeneoides sulphureus*, Day gave the fin formula as D.8/ 1/8 P.15 V.1/5 A.7 C.15 L.1.35-38 L. tr. 2 1/2/7. In this specimen, he described the presence of a brilliant-golden stripe, two-third as wide as a scale, passing from the orbit to the upper third of the tail with, generally, 2-3 more stripes below and parallel to it. In larger specimens, a light band passes along the row of scales above the lateral line. The caudal fin was described to be reddish, with a black white-edged margin. In a few specimens he found bands as many as in *U. vittatus* (but in *U. vittatus* bands are present on both the lobes of the caudal fin). Similarly, as in *U. fasciolatus*, he mentioned the presence of six rows of scales between the two dorsal fins and the first dorsal to be milk white with black edge, having two horizontal yellow lines finely dotted with black colour and the second dorsal with only one band.

In the present specimen, there is a bright yellow median horizontal stripe from the eye to the caudal peduncle. There are 5-6 oblique reddish brown bands on the upper lobe of the caudal fin, the second band extending to the hind margin of the lower lobe. The two dorsal fins are separated by five rows of scales. The first and second dorsal fins have three reddish brown horizontal lines though somewhat ill-defined.

From the description given by Day (1868, 1878), it is quite apparent that the specimen in hand, identified as *U. moluccensis*, is quite different from that of *Upeneoides fasciolatus* and *Upeneoides sulphureus*. Lachner (1960) stated that many species show differentiation only in colouration, such as the presence or absence of a spot or colour mark or its shape or location. He further stated that there are few meristic characters that aid in the separation of the species which resulted in their confusing nomenclature.

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*Originals not seen