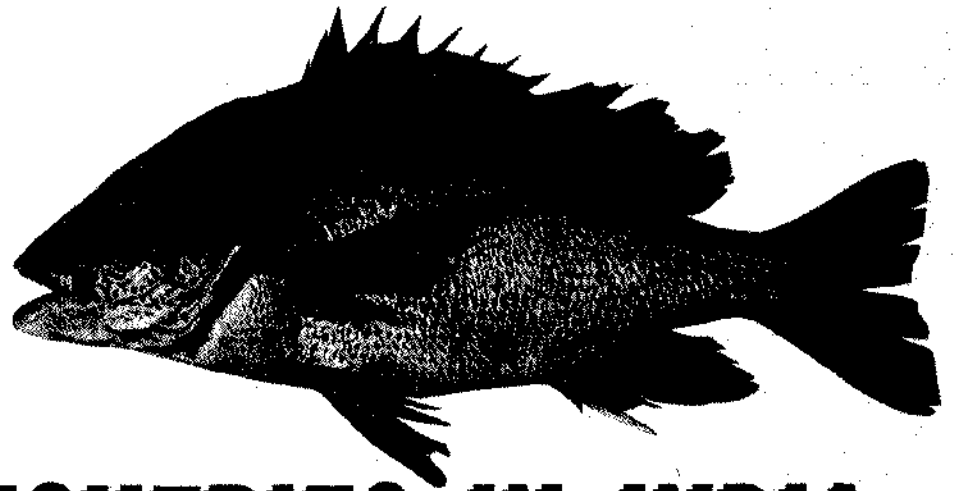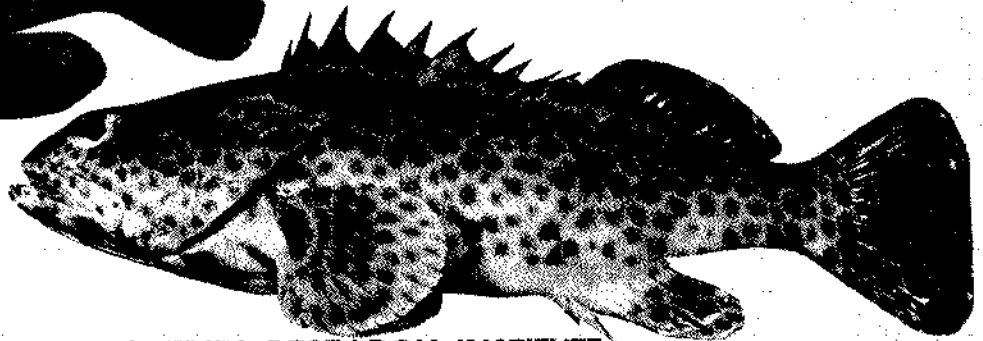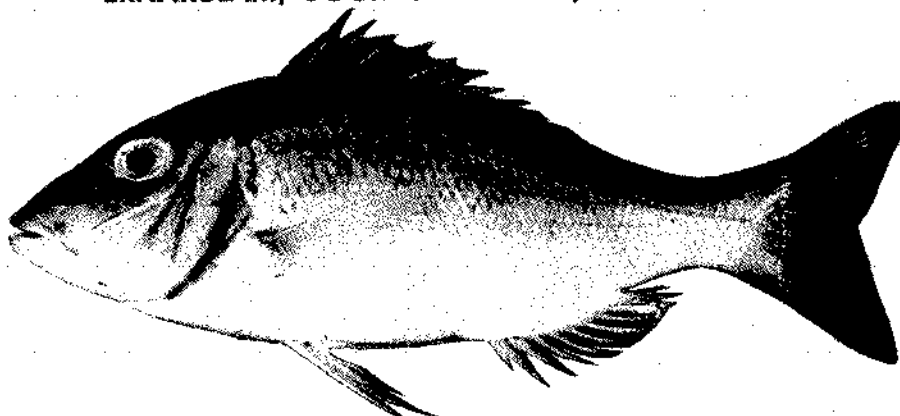# C M F R I
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# LENGTH - WEIGHT RELATIONSHIP OF *LUTJANUS RIVULATUS* OFF TUTICORIN, GULF OF MANNAR

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ABSTRACT

Length - weight relationship of *Lutjanus rivulatus* exhibits isometric growth since its regression coefficient did not significantly differ from 3. The relative condition factor $K_n$ indicates that the older specimens measuring above 420 mm were more healthy and robust than the younger individuals.

## INTRODUCTION

Length - weight relationship of *Lutjanus rivulatus* a perch which constitutes a fishery of considerable magnitude off Turicorin is presented here with a view that this information will be of immense use for various biological purposes such as estimation of asymptotic growth in weight, computation of yield per recruit as per the classical model of stock assessment (Beverton and Holt, 1957) and in the estimation of optimum age of exploitation and potential yield per recruit as per Krishnan Kutty and Qasim (1968), which are essential parameters for proper exploitation and management of any resource.

## MATERIAL AND METHODS

Total length in mm and wet weight in gram of 279 specimens of *L. rivulatus* ranging in size from 110 mm to 760 mm have been collected from commercial trawl net landings at Tuticorin. Logarithmic values of total length and wet weight were computed as per the Least squares method (Snedecor and Cochran, 1967). The regression coefficient 'b' was subjected to 't' test to find out whether the b value differs from the theoretical value of 3, as this value is supposed to be around 3 when the growth of the fish is isometric.

## RESULTS AND DISCUSSION

Based on the above said method the length - weight relationship of *L. rivulatus* is described by the following equation and depicted in Fig. 1.

$$Log\ W = -4.6821 + 2.9562\ Log\ L\ (r = 0.9620)$$

Unchanging body form and specific gravity of a fish are supposed to yield a regression
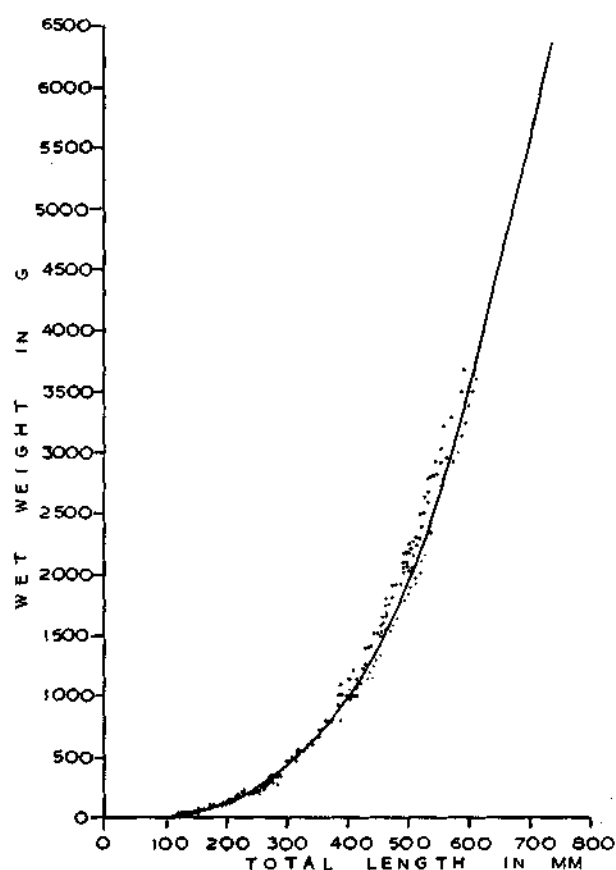


Fig. 1. Length - weight relationship of *L. rivulatus* obtained from trawl net landings at Tuticorin.

coefficient value of 3 which means that the fish exhibits an isometric growth. A large number of

species possess isometric growth following the cube law. Whereas some of the species exhibit

observed weight and w is the estimated weight, could be expected to indicate the well being of

TABLE 1. *Relative condition factor $K_n$ of* L. rivulatus *at different sizes obtained at Tuticorin*

| Total length (mm) | No. of fish | Kn | Total length (mm) | No. of fish | Kn |
|---|---|---|---|---|---|
| 110-119 | 2 | 0.80 | 360-369 | 5 | 1.04 |
| 120-129 | 6 | 1.04 | 370-379 | 4 | 1.06 |
| 130-139 | 3 | 0.96 | 380-389 | 7 | 1.06 |
| 140-149 | 5 | 0.82 | 390-399 | 5 | 0.99 |
| 150-159 | 3 | 0.90 | 400-409 | 7 | 0.98 |
| 160-169 | 6 | 0.93 | 410-419 | 4 | 0.97 |
| 170-179 | 7 | 1.05 | 420-429 | 8 | 1.00 |
| 180-189 | 3 | 0.97 | 430-439 | 3 | 1.08 |
| 190-199 | 7 | 0.92 | 440-449 | 5 | 1.04 |
| 200-209 | 6 | 1.02 | 450-459 | 7 | 1.02 |
| 210-219 | 9 | 1.07 | 460-469 | 9 | 1.09 |
| 220-229 | 6 | 1.00 | 470-479 | 8 | 1.08 |
| 230-239 | 6 | 0.92 | 480-489 | 8 | 1.07 |
| 240-249 | 5 | 0.92 | 490-499 | 9 | 1.11 |
| 250-259 | 6 | 0.85 | 500-509 | 5 | 1.10 |
| 260-269 | 9 | 0.95 | 510-519 | 4 | 1.09 |
| 270-279 | 9 | 0.97 | 520-529 | 3 | 1.13 |
| 280-289 | 5 | 0.87 | 530-539 | 5 | 1.10 |
| 290-299 | 5 | 1.03 | 540-549 | 3 | 1.12 |
| 300-309 | 13 | 1.00 | 550-559 | 3 | 1.16 |
| 310-319 | 12 | 0.98 | 560-569 | 1 | 1.20 |
| 320-329 | 9 | 0.96 | 570-579 | 1 | 1.12 |
| 330-339 | 9 | 1.02 | 580-589 | 1 | 1.11 |
| 340-349 | 3 | 0.95 | 590-599 | 1 | 1.14 |
| 350-359 | 8 | 1.01 | 600-609 | 1 | 1.13 |
|  |  |  | 720-729 | 1 | 1.03 |

allometric growth due to the change in the specific gravity and body form. The b value of *L. rivulatus* was subjected to 't' test and the test revealed that this species exhibits isometric growth since its b value did not significantly differ from the theoretical value of 3. Vivekanandan and James (1984) have observed that both the sexes of the threadfin-breams *Nemipterus tolu, N. delagoae* and *N. luteus* to exhibit isometric growth in Madras waters whereas the b value of the females of *N. mesoprion* was significantly different from 3 indicating an allometric growth.

The relative condition factor Kn obtained from the relation $K_n$ = W/w where W is the

the fish, its relative robustness, suitability of habitat and to some extent the size at first maturity and peak period of spawning. The $K_n$ factor obtained for *L. rivulatus* is given in Table 1 and it indicates that the $K_n$ factor is around or less than one in the lower size ranges from 110 to 410 mm. Whereas above 420 mm the $K_n$ factor is higher than 1.0 indicating that the larger specimens of this species were more healthy and robust than the smaller young ones. Similar observation was made by Fawzy and Soliman (1984) in a smaller perch *Upeneus sulphureus* in Safaga Bay of the Red Sea.