OBSERVATIONS ON THE INDIAN MACKEREL, RASTRELLIGER CANAGURTA (CUV) FROM PURSE-SEINE CATCHES ALONG GOA COAST

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ABSTRACT

The present study is based on 351 specimens of the Indian mackerel (Rastrelliger kanagurta) collected during the period October, 1965 to January, 1966 from the purse-seine catches at Panaji. No appreciable difference between males and females has been noticed in the length-weight relationship of mackerel observed in present investigation. The predominant group in the food item was Dinophyceae constituting about 50.3% in count value. The other important groups were Diatoms, Copepods, Bivalves and Miscellaneous items.

INTRODUCTION

The mackerel landings in Goa (Lat. 14° 54' and 15° 48' N, Long. 73° 41' and 74° 20' E) constitute 20% of the mackerel catch in India. It forms an important fishery along the west coast from Ratnagiri to Quilon in the South. The mackerel landings constitute 23 to 89% of total fish landed in Goa (Anonymous, 1972). During 1965, 3920 metric tonnes of mackerel were landed. Every year, during the post-monsoon period from October onwards shoals of mackerel appear along the coastal belt.

The fishery and biology of mackerel have been studied by Devanesan and John (1940), John and Menon (1942), Pradhan (1956), George and Annigeri (1960) but in Goa region no work has been done so far on the ecology and biology of mackerel. An ecological study covering length-frequency, length-weight relationship and food habits have been undertaken and the data relating to the period from October 1965 to January 1966 presented in this paper.

MATERIAL AND METHODS

For this study, 351 specimens of mackerel ranging from 10.1 to 26.0 cm were collected from purse-seine catches. The weight of the specimens varied from 11 to 180 gms. The total length of the individual fish was measured to the nearest millimeter and the measurements were grouped into 1 cm size class. Later, the body weight was recorded to the nearest 0.5 gm. The stomachs were carefully removed and preserved in 5% formalin for further analysis.
The volume of the stomach contents was determined by displacement method. The stomach contents were made to the known volume and an aliquot of 1 ml was pipetted into a counting chamber and analysed by numerical and points method (Pillay 1952).

**LENGTH-FREQUENCY DISTRIBUTION**

The length-frequency was studied from October, 1965 to January, 1966 and the data on occurrence of monthly size-range and modes, is presented in the Table. It is seen that the principal mode at 14.5 cm is present throughout the period of observation. A shift in the mode, indicating average monthly growth is clearly visible from October to January. The mode at 14.5 cm observed in the month of October has shifted to 16.5, 20.5 and 21.5 cm size group in following months (November to January) and thus the rate of growth during a period of three months appear to be 7 cm, growing at an average rate of about 2.33 cm per month.

**TABLE 1. Showing month-wise size range and graphic modes in *R. canagurta*.**

<table>
<thead>
<tr>
<th>Month and Year</th>
<th>Size Range (cm)</th>
<th>Graphic modes (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October, 1965</td>
<td>11.1 — 20.0</td>
<td>14.5</td>
</tr>
<tr>
<td>November, 1965</td>
<td>10.1 — 26.0</td>
<td>16.5, 23.5</td>
</tr>
<tr>
<td>December, 1965</td>
<td>18.1 — 25.0</td>
<td>20.5, 23.5</td>
</tr>
<tr>
<td>January, 1966</td>
<td>20.1 — 24.0</td>
<td>21.5</td>
</tr>
</tbody>
</table>

A secondary mode at 23.5 cm was also seen during November and December. Another mode at 11.5 cm during November was present besides 14.5 and 23.5 cm. But during the subsequent months, the younger fishes of size range 11-12 cm as represented by mode at 11.5 cm were not observed. The mode as observed in November and December at 23.5 cm size group appears to be the older age group.

**LENGTH-WEIGHT RELATIONSHIP**

For determining the length-weight relationship, 351 mackerel ranging in size from 10.1 to 26.0 cm were studied and the weight of each individual fish was recorded and later grouped into 1 cm length classes. Out of 351 mackerels examined during the period October 1965 to January 1966, 153 were males, 161 females and rest indeterminate. The average length and weight of each class was calculated and then fitted into the equation \( W = aL^b \) (where, \( W \) = weight, \( L \) = length of fish and \( a \) and \( b \) are the constants whose values are determined empirically). The length-weight relationships of male and female mackerel based on the analysis of 314 specimens are given below.
The length-weight relationships observed by Narayana Rao (1962) for male and female mackerel were \( W = 0.004984 \ L^{3.2628} \) and \( W = 0.004784 \ L^{3.2785} \) respectively. These values appear to be slightly higher than that of Pradhan (1956) who has established the relationship as \( W = 0.005987 \ L^{3.1737} \). No appreciable difference has been noticed in length-weight relationship of males and females in the present investigation.

**FOOD OF MACKEREL**

The food habits of the Indian mackerel on the west coast have been investigated in some details by Devanesan and John (1940), John and Menon (1942), Chidambaram (1944), Bhimachar and George (1952) and Pradhan (1956). These authors indicate that the mackerel on the west coast feeds both on Zoo- and Phytoplankton depending on their availability in the area. Bhimachar and George (1952), Pradhan (1956) and George and Annigeri (1960) believe that the food habits of the juveniles and the adults do not differ much.

In the present investigation the food has been studied from October to January. The number of specimens analysed from October to January were 110, 94, 80 and 30 respectively. It is seen that during this period the dominant groups were dinophyceae 50.3%, diatoms 28.5%, copepods 12.5%, bivalves 6.2% and miscellaneous items 2.5%.

However, in order to find out variation of each group the observations have been given below.

**Dinophyceae:** They were encountered in almost all the stomachs examined and found throughout the period of study. During December and January the dominant groups recorded in the order of their importance were Dinophysis, Ornithocercus spp., Peridinium spp., Ceratium tripos, C. furca, C. fusus and Triposolema spp.

**Diatoms:** The predominant food element was Coscinodiscus. Some of the other genera of diatoms met with in the gut contents were Pleurosigma spp., Planktoniella spp., Rhizosolenia spp., Chaetoceros spp., Ditylum spp., Biddulphia spp., Triceratium spp., Bacillariastrium spp., Nitzschia spp., Thalassiothrix sp. and Lauderia spp.

**Copepods:** Copepods were mainly composed of two groups namely Calanus spp. and Temora longiceps.

**Bivalves:** Bivalves were at their peak in the months of October and December. However, this food item was also noticed in other months in the gut contents.
Miscellaneous: This group was represented in gut contents in all the months. The predominant among all was Tintinnids followed by Nauplii of Decapod Crustacea, Radiolaria, Cytiorocylia, Cladocerans and Euphausid larvae. Cladocerans were represented by only one species during the period October to December. Euphausid larvae have been observed in December.

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REFERENCES


