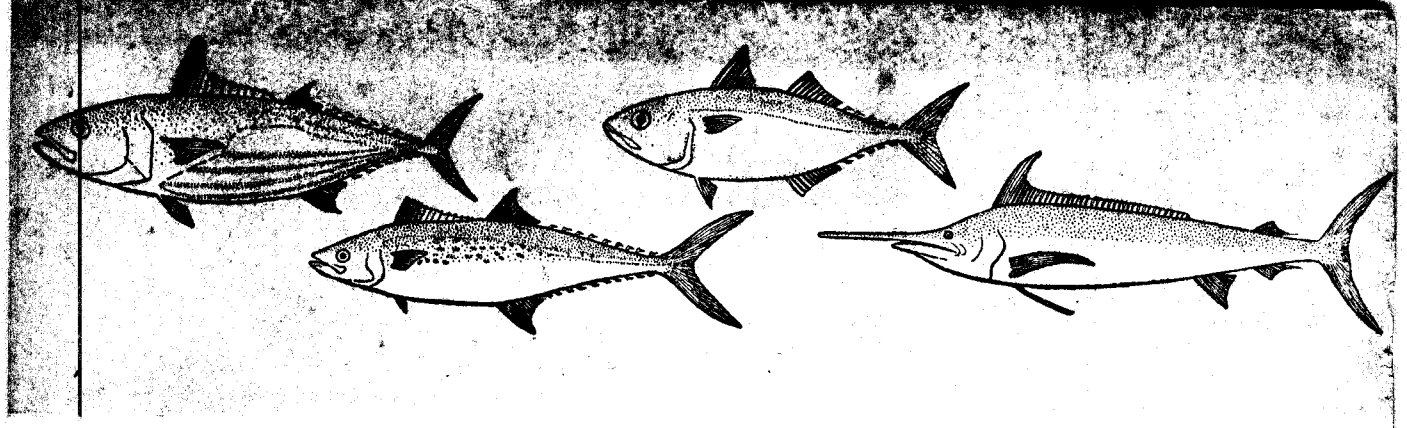
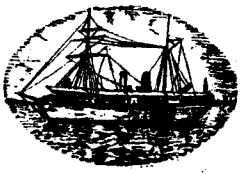


SYMPOSIUM ON

SCOMBROID FISHES

PART III



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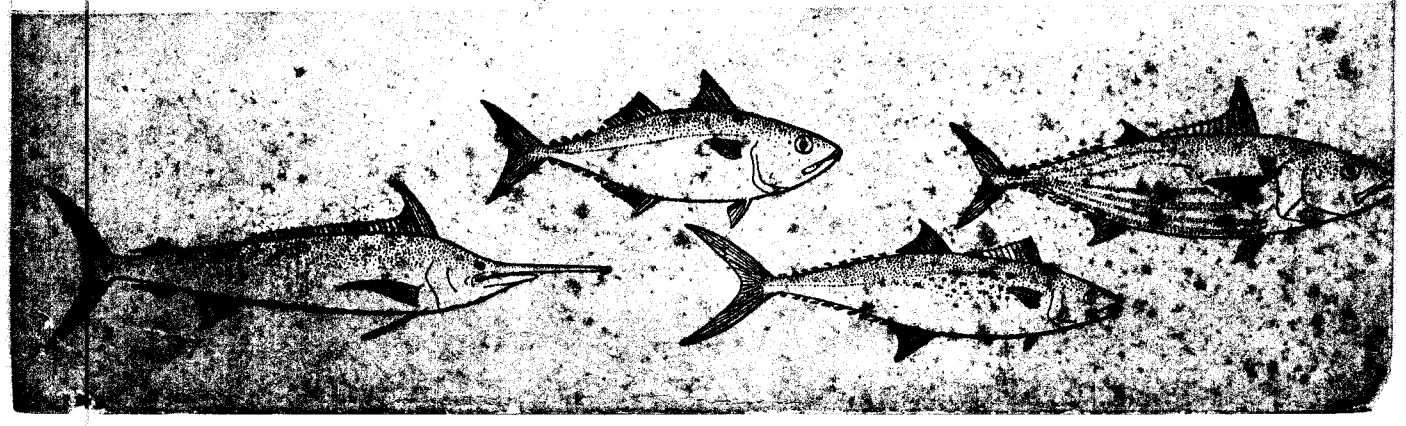
S. INDIA

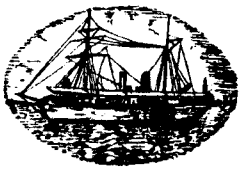


PROCEEDINGS OF THE

SYMPOSIUM
ON
SCOMBROID FISHES

HELD AT MANDAPAM CAMP FROM JAN. 12-15, 1962

PART III



SYMPOSIUM SERIES I

MARINE BIOLOGICAL ASSOCIATION OF INDIA

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SIZE COMPOSITION OF THE OCEANIC SKIPJACK *KATSUWONUS PELAMIS* (LINNAEUS) AND THE YELLOWFIN TUNA *NEOTHUNNUS MACROPTERUS* (TEMMINCK AND SCHLEGEL) FROM THE LACCADIVE SEA AROUND MINICOY DURING THE SEASON 1960-61*

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THE tuna fishery of Minicoy island depends mainly on the oceanic skipjack *Katsuwonus pelamis* and to a smaller extent on the yellowfin tuna *Neothunnus macropterus*. A comprehensive account of the fishery has been given by Jones and Kumaran (1959). The gear employed is the pole and line, using live-bait fishes. Data on the size composition of tunas are of value in elucidating their population structure and migrations. An intensive study on the fishery of the island was carried out during the tuna fishing season November 1960-April 1961. The results of the investigation are presented in this report. The size composition of the two species for the season has been studied by the examination of samples from the landings in Minicoy. Data on the total catches of each species and the catch-per-man hour-effort are also given.

MATERIAL AND METHODS

Field measurements of the length of *Katsuwonus pelamis* and *Neothunnus macropterus* were taken on all fishing days. The number of fish desired per sample while not precisely determined, was tentatively set at thirty, though it varied from sample to sample, by sudden set-backs in the fishery. The total length of each fish, the distance from the tip of the mouth with the jaws closed to the cartilaginous median part of the caudal fork was recorded in millimeters according to the methods of Marr and Schaefer (1949). The total weight of each fish was taken by means of a spring balance and was recorded in pounds and fractions of a pound. The number of samples examined each month was approximately 20, though during November only two samples were examined, as the observations could be started only by the end of the month.

Twenty-six boats were engaged in tuna fishing in Minicoy during the season. The catches brought in by all the boats on all fishing days were recorded according to the species. As it was not possible to weigh the landings of each boat, the number of fish in each boat was recorded according to the species. The total weight of each species was calculated from this, the average weight of one fish being known from the sample weighed.

In the calculation of man-hour-effort, only the adult men were counted. Almost an equal number of boys of various ages also go in each fishing boat to help in the rowing of the boat and in bailing out the water coming out of the bait wells. As they do not actively participate in fishing, they were left out from the calculation. Time of absence from the landing place has been calculated from observations on the time of departure and arrival. But as the bait fish are collected on the way to the fishing grounds, two hours per boat have been deducted for this. In addition, three hours per boat were also deducted being the average time taken for the journey to the fishing grounds and back.

The frequencies of each length in any one month were combined and converted into percentages of the total for the month. The values are plotted as monthly percentage length frequency distributions. The latter are presented for each species in the accompanying figures.

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Catch Statistics

Table I shows the monthly catches in Minicoy according to the species and also the man-hour-effort for each month. The total catches of all fishes during the season was 1149153.33 Kgs.

Table I

The effort in man-hours and the catch in Minicoy during the season 1960-61

Month	Effort in Man-hours	*Katsuwonus pelamis* Kgs.	*Neothunnus macropterus* Kgs.	Other fishes Kgs.	Total catch Kgs.	Catch-per-man-hour-effort Kgs.
December 1960	6,30,979	3,24,740.85	7,023.33	405.17	3,32,169.35	0.526
January 1961	6,74,417	5,30,295.54	11,951.45	623.00	5,42,869.99	0.805
February 1961	2,17,521	1,26,455.19	4,292.02	660.20	1,31,407.41	0.604
March 1961	1,92,796	73,789.97	604.17	847.20	75,241.34	0.390
April 1961	1,41,296	65,941.48	1,457.69	66.07	67,465.24	0.477
Season	18,57,009	11,21,223.03	25,328.66	2,601.64	11,49,153.33	0.619

This includes *Katsuwonus pelamis*, *Neothunnus macropterus*, *Auxis thazard*, *Euthynnus affinis*, *Acanthocybium solandri*, *Istiophorus gladius*, *Elagatis bipinnulatus*, *Coryphaena hippurus*, *Caranx* sp., *Chorinemus* sp. and sharks. Of this *K. pelamis* formed 11,21,223.03 Kgs. and *N. macropterus* 25,328.66 Kgs. The catch-per-man-hour-effort for the whole season has been calculated to be 0.62 Kgs. (Fig. 1).

The monthly landing of each species are given in Fig. 2. The maximum catch was in January for both the species. December came next followed by February. The lowest catch was recorded in March. There was a revival of the fishery in April.

Length Frequency Distribution of *Katsuwonus pelamis*

The length frequency distribution of the species during the season is given in Fig. 3. 2247 specimens have been examined for the purpose. Only 66 specimens belonging to two samples could be examined during November as the observations were initiated only at the end of the month. Their size ranged from 380 mm. to 545 mm., with the mode at 430 mm. The fishery was comparatively poor during November and the first fortnight of December. During December, 622 specimens belonging to 20 samples were examined. The size composition of the fishes landed during the first fortnight had a marked difference with that of the fishes landed during the second fortnight. Fishes of the size group 340-540 mm. predominated in the catches during the first fortnight, while those landed during he second fortnight belonged to a larger size ranging from 500 mm. to 720 mm. The catches improved by the beginning of the second fortnight of December and

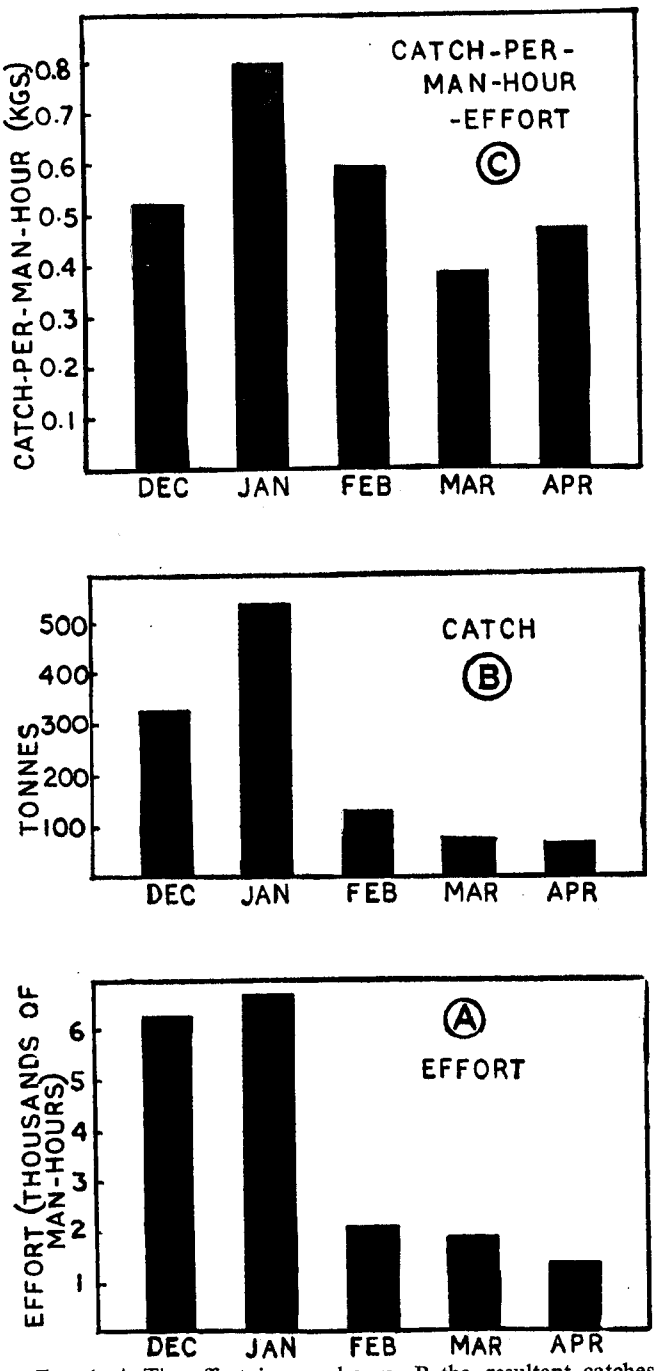

FIG. 1. A The effort in man-hours, B the resultant catches and C the catch-per-man-hour-effort in Minicoy during the season 1960-61.

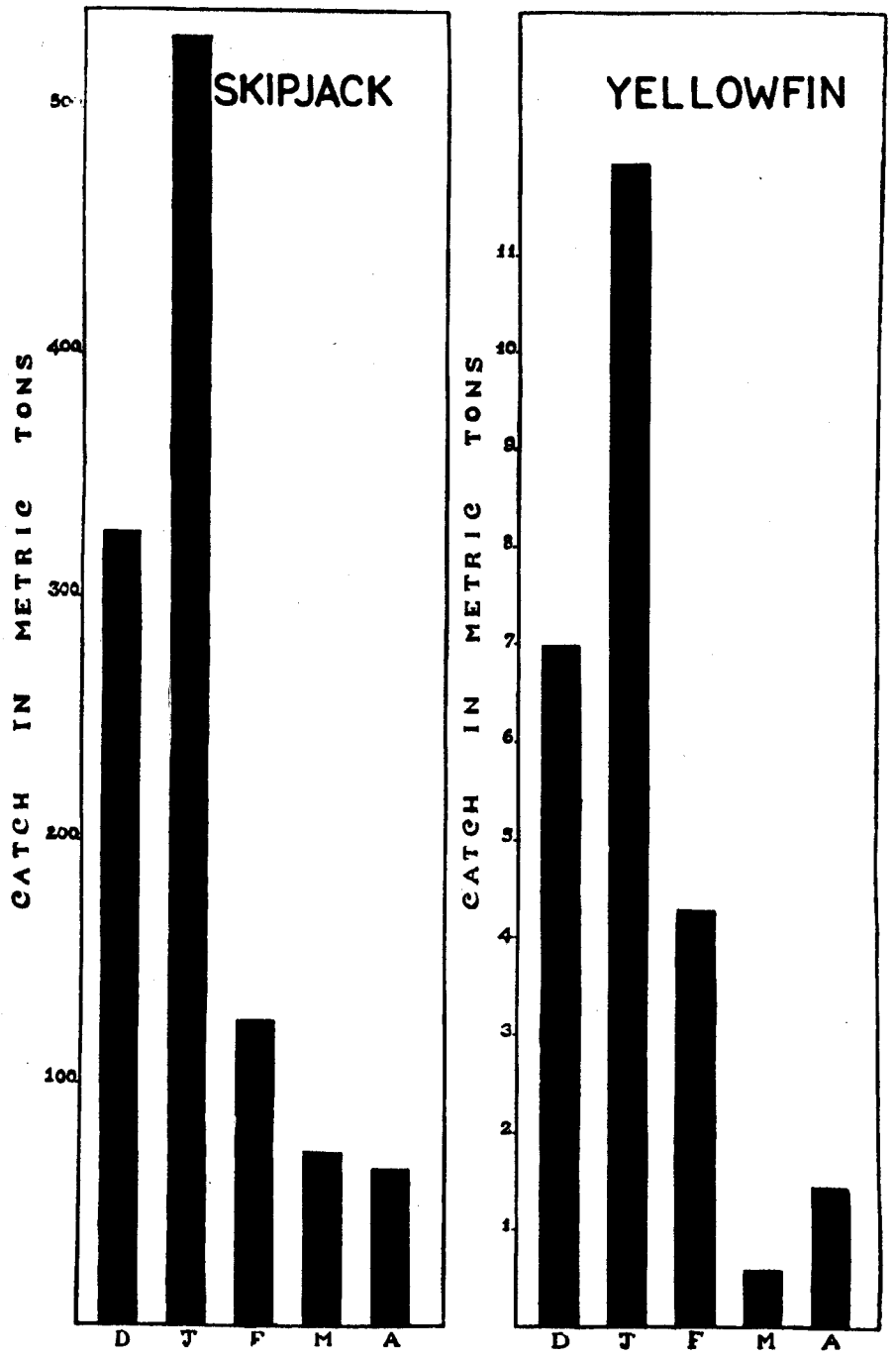

FIG. 2. Catches of *Katsuwonus pelamis* and *Neothunnus macropterus* in Minicoy during the season 1960-61.

during the last week very heavy catches were brought in by all the boats. The fishery continued to be good in January. The total catches in January exceeded those of all the other months. 518 specimens were examined during the month. They belonged to 20 samples. The graph for the month is unimodal, with the size group 560-600 mm. predominating. The mode was at 570 mm. During February, 20 samples comprising 519 specimens were examined. The graph for the month is bimodal, with one mode at 470 mm. and the other at 570 mm. 314 specimens belonging to 14 samples were examined during March. The graph shows two modes, one

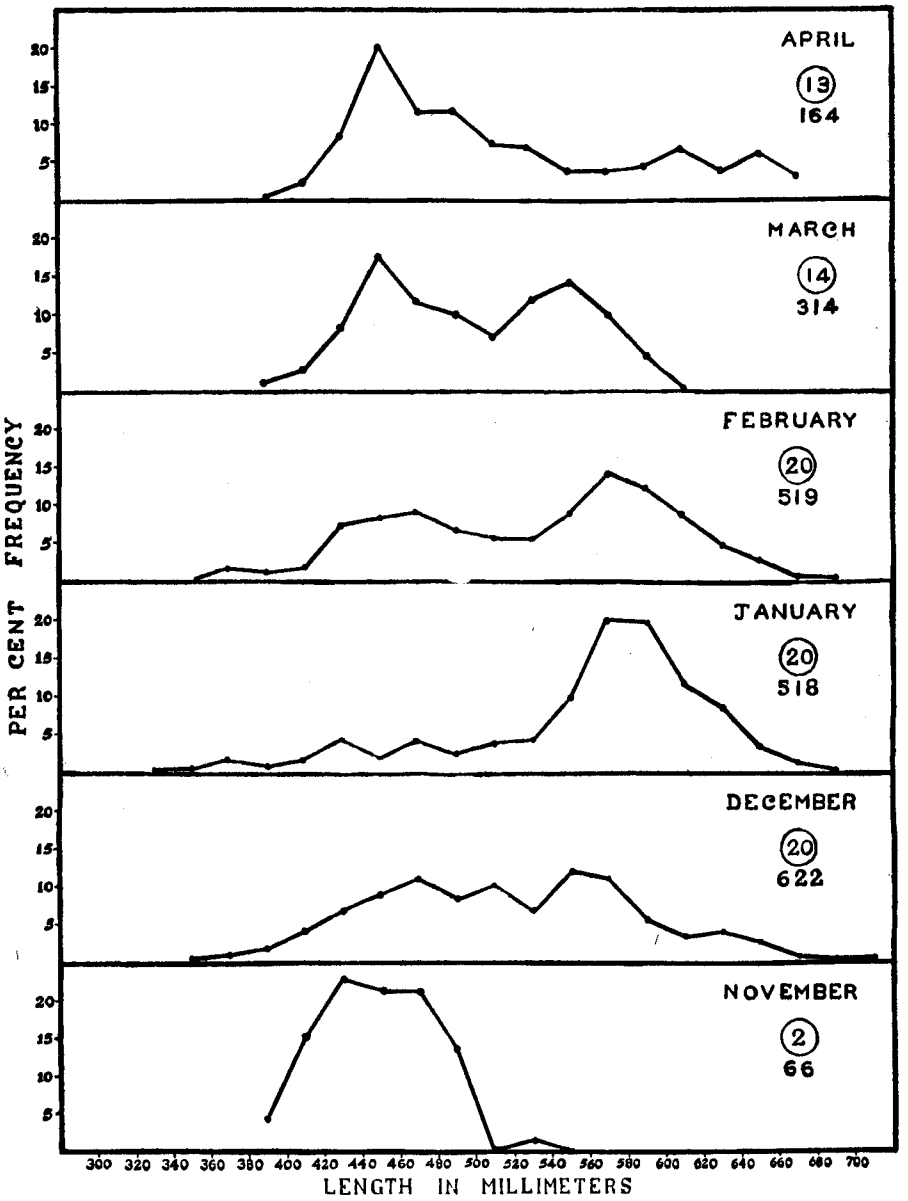

FIG. 3. Length frequency distribution of *Katsuwonus pelamis* in Minicoy during the season 1960-61. The number inside the circle denotes number of samples and that below it is the number of specimens examined during a month.

at 450 mm. and the other at 550 mm. ; the entry of smaller fish into the fishery is indicated. The fishery was comparatively poor during the month. This condition continued during April also. 164 specimens belonging to 13 samples were examined during April. They ranged in size between 380 mm. and 680 mm. with the mode at 450 mm. The number of larger fish dwindled during the month.

Length Frequency Distribution of *Neothunnus macropterus*

The length frequency distribution of the species during the season is given in Fig. 4. 803 specimens were examined during the course of the study. The number of fish in a sample could not be fixed as the specimens became rare occasionally. 269 specimens belonging to 16 samples were examined during December. They ranged in size from 340 mm. to 840 mm. with two modes, one at 450 mm. and the other at 670 mm. During January 17 samples comprising 302 specimens were examined, the majority of them belonging to the size group 470-520 mm. During February, 181 specimens belonging to 15 samples were examined. The smallest fish of the season occurred during the month, the minimum size being 270 mm. The graph for the month shows three peaks, one at 310 mm., another at 410 mm. and the third one at 650 mm. The number of fish available for examination was small during March and April. During March 27 specimens belonging to 11 samples were examined. They ranged in size from 380 mm. to 690 mm. with the mode at 430 mm. 25 specimens belonging to 6 samples were examined during April. They ranged in size from 420 mm. to 670 mm.

Discussion

As the observations are confined to one season only it is not possible to derive the age groups from the data. But a comparison with the observations on the size composition of the two species from the Eastern Tropical Pacific Ocean (Schaefer 1959) shows that the live-bait fishery for the oceanic skipjack and yellowfin tuna in that region also depends more or less on the same size groups. The fishery there operates on one or at the most two age groups of fish in the case of *Katsuwonus pelamis*, which enters the fishery at a size of 45-50 cm. and are probably two years old then. The larger group has a modal size of 60-70 cm. Groups of fish larger than 70 cm. a e almost non-existent in the catches there. The fishery in Minicoy depends probably on three age groups of *Katsuwonus pelamis*. The first group is of the size 280-450 mm. their age being probably above one year. The second group of fish range in size from 450 mm. to 600 mm. and are p. obably above two years old. The larger fish ranging in size from 600 mm. to 730 mm. are probably three years old. Fishes four years old and above that are non-existent in the catches in Minicoy.

Hennemuth (1961) fixes the size of yellowfin tuna one year old as 550 mm. appi oximately. According to him, yellowfin at the age of two years average 850 mm. and at three years 1230 mm. When compared with this it is seen that the entire fishery for yellowfin in Minicoy is suppo ted by fish of less than two years. The majority belong to the O-year group.

Though fish of size less than 280 mm. may occur in the vicinity of the island they do not occur in the catches probably owing to the selectivity of the gear.

Summary

The size composition of *Katsuwonus pelamis* and *Neothunnus macropterus* from the Laccadive sea around Minicoy during the season 1960-61 has been studied. The catch statistics and the catch-per-man-hour-efforts are also given. *K. pelamis* ranges in size from 280 mm. to 720 mm. Fish above 720 mm. do not occur in the fishery there. Yellowfin ranges in size from 270 mm. to 830 mm. Fishes of smaller size groups do not occur in the catches probably owing to the selectivity of the gear though they may occur in the vicinity of the island.

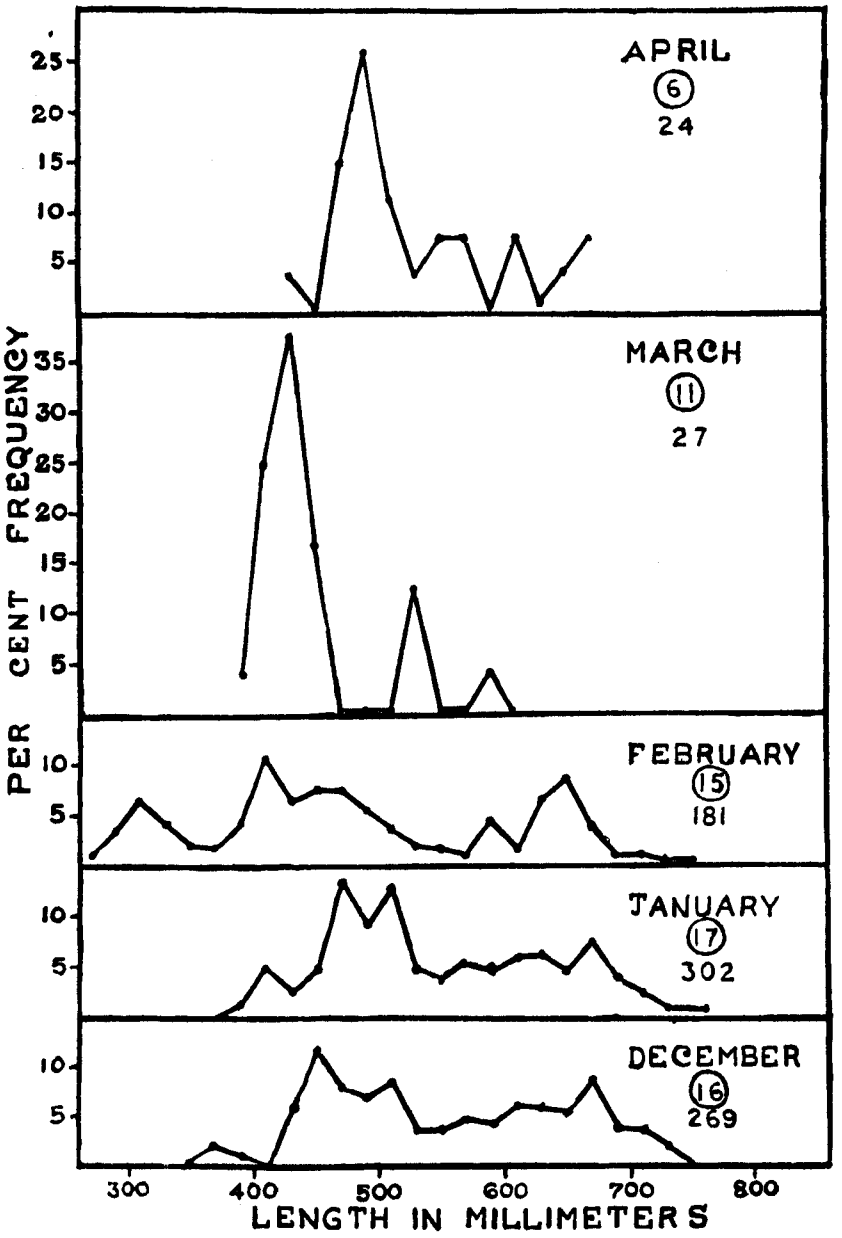

FIG. 4. Length frequency distribution of *Neothunnus macropterus* in Minicoy during the season 1960-61. The number inside the circle denotes the number of samples and that below it is the number of specimens examined during a month.

ACKNOWLEDGEMENT

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