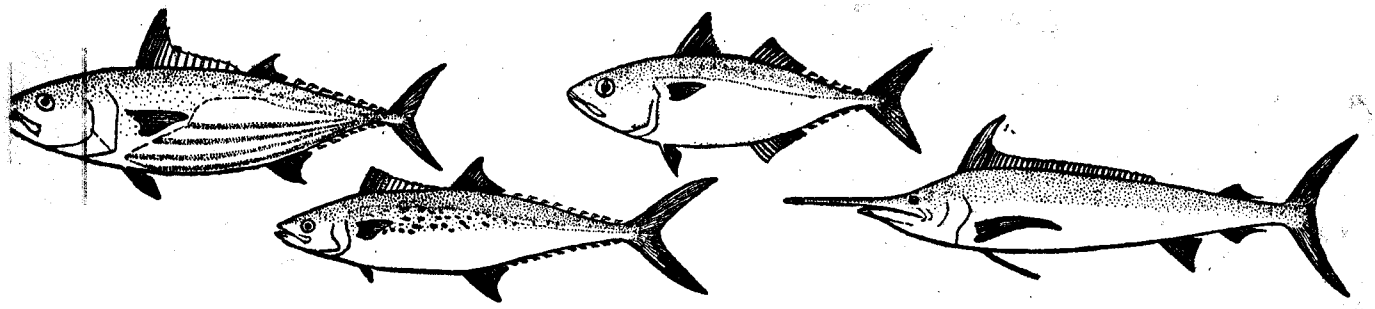
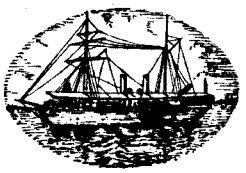


SYMPOSIUM ON SCOMBROID FISHES

PART II



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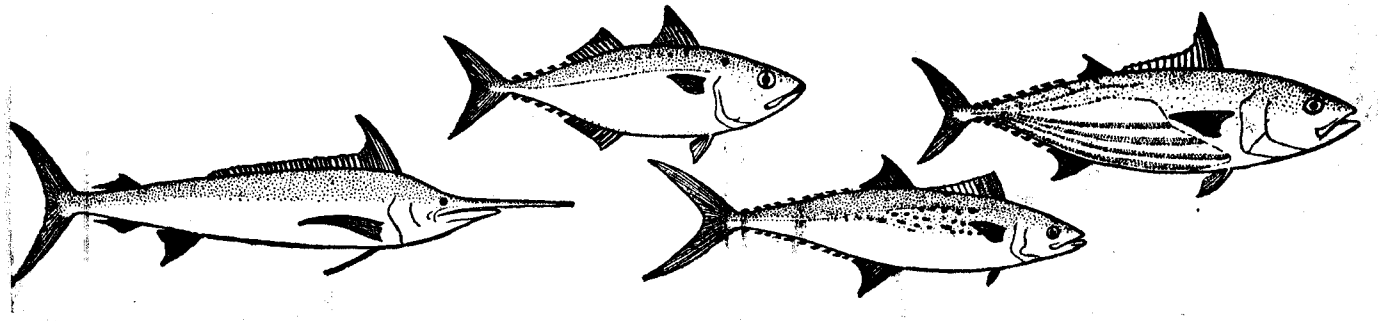
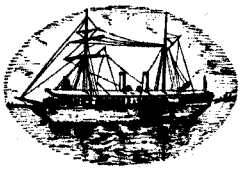


PROCEEDINGS OF THE

SYMPOSIUM
ON
SCOMBROID FISHES

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

PART II



SYMPOSIUM SERIES I

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EUTHYNNUS AFFINIS AFFINIS (CANTOR) IN THE VIZHINGAM FISHERIES*

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IN the fisheries of Vizhingam seven different types of tuna are distinguished. They are *Auxis thazard* (Lacepede), *Auxis thynnoides* Bleeker, *Sarda orientalis* (Temminck and Schlegel), *Kishinoella tonggol* (Bleeker), *Neothunnus macropterus* (Temminck and Schlegel), *Katsuwonus pelamis* (Linnaeus) and *Euthynnus affinis affinis* (Cantor). A comprehensive account on their identification is given by Jones and Silas (1960). The little tunny or mackerel tuna (*Euthynnus affinis affinis*) is commercially one of the most important species at Vizhingam. The fisheries of the little tunny have assumed importance in recent years owing to the great demand for dried tuna in India and abroad. Research on the biology and fishery of the little tunny has been but meagre and practically no information is available on these subjects. In this paper some aspects of its biology are dealt with based on material from Vizhingam.

Fishing methods

The fishing for the little tunny is carried on almost exclusively by dugout canoes and catamarans. The principal gears now used include drift nets (cotton and nylon drift nets) and hook and line. Occasionally schools of tuna are encircled by shore seines. Highest percentage of tuna is caught on drift nets. In recent years nylon drift nets are used to accelerate the catch. Classification of catch by the different gears is available from July 1960 to October 1961. Of the total landing of 317.617 tonnes of little tunny the highest catch of 226.24 tonnes or 71.4% is obtained by the drift nets, followed by hook and line with 77.889 tonnes or 24.3% and shore seines with 13.488 tonnes or 4.3%. It seems apparent that the two types of drift nets (cotton and nylon drift nets) are the most important gear used in the tuna fishing and the next important tuna gear is the hook and line.

Yield of the commercial fishery

The development of the fishery for tuna at Vizhingam is of particular interest. Statistical data of tuna catches are available from 1956. From 1956 to 1960 the annual yield rose steadily from 85.675 tonnes to 205.768 tonnes. In 1959 the yield declined slightly to 104.537 tonnes. The remarkable rise during 1960 and in the first ten months of 1961 is due to a larger extent to greater efforts of the fishermen by using nylon drift nets. In general there was a considerable increase in tuna fishing during 1960 and 1961 when fishing for tuna became more remunerative because of increase in prices. From the above it appears that the relative increase in the catch of the commercial fishery in 1960 and 1961 is about twice as large as in 1956. In 1961 the tuna catch even surpassed that of the major fisheries (rainbow sardine and anchovies) and was first in importance in the local fishery.

Analysis of the monthly data for 1956 to 1961 shows that fairly good landings of tuna usually occur during the eight months from October to May. June to September is the period of low catch. The magnitude of the monthly landings is well indicated in the table (table 1). With the onset of southwest monsoon when sea becomes rough, tuna fishing is very little and the catches decline.

Size composition of fish

The size composition of the little tunny fished at Vizhingam is available for the period from July 1960 to October 1961. The fish caught during the period measure from 15 cm. to 70 cm. in length. The smallest size group was fished by shore seine during October. As to the composition of fish population by size the greater part of the catch is grouped around 53 cm. Table 3

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shows the maximum and minimum lengths recorded during the different months. As all the materials have been collected from commercial catches the youngest year class is not represented. Mainly large specimens only have come into the material.

TABLE 1

Landings of *E. affinis affinis* (Cantor) at Vizhingam, in kilograms

Months	1956	1957	1958	1959	1960	1961
January	12091	8929	5725	6130	4360	8436
February	8827	3970	10843	2737	15998	16825
March	6198	25761	8022	8022	15501	24384
April	8444	10446	1957	4498	4623	32236
May	6151	4131	3602	7105	11192	27775
June	—	3937	3086	1501	2290	1259
July	—	13405	—	567	510	290
August	324	402	—	11952	5663	10072
September	—	—	19072	26957	7067	21999
October	4514	5394	25580	9499	81026	22537
November	26675	16267	15462	20560	34969	
December	12451	2621	32753	5009	22569	
Total	85675	95263	126102	104537	205768	165813
Total fish landings in m. tons. ..	2692.5	3152.5	2803.75	1776.25	4611.85	1722.2

Maturity of gonads

The sexual maturity and reproduction of the tuna have been examined by macroscopic observation of the gonads. Specimens were, on few occasions, caught with gonads in a ripe and running condition. The assessment of gonad maturity was made in accordance with the international maturity scale. The spawning season, although not rigidly fixed, extends from April to September each year. Examination of the ovaries in April indicated that spawning has already set in and that it starts earlier than April. Some specimens which were in partly spent and oozing

TABLE 2

Landings of *E. affinis affinis* at Vizhingam by various gear, in kilograms

Months	Drift net	Hook & line	Shore seine	Total
July 1960	—	510	—	510
August	3237	2426	—	5663
September	5763	1304	—	7067
October	65036	15726	264	81026
November	27117	7141	711	34969
December	17435	5134	—	22569
January 1961	6970	1466	—	8436
February	12467	2994	1364	16825
March	15890	3259	5235	24384
April	18470	8881	4885	32236
May	14151	13513	111	27775
June	—	1123	136	1259
July	—	290	—	290
August	8881	1191	—	10072
September	15409	6467	123	21999
October	15414	6464	659	22537
Total	226240	77889	13488	317617
Percentage	71.4	24.3	4.3	

stages were obtained in July, August and September. Landings in October included spent specimens. Appearance of juveniles (as small as 15 cm.) was observed in October 1960. Jones (1960) refers to the occurrence of 24.5 cm. long juveniles in May 1956. Landings in June and July show specimens with immature and maturing ovaries (stages I to V). All the evidence indicates that the main spawning of *E. affinis affinis* takes place in the period April to September. This period is not rigidly fixed and spawning may begin as early as March and last till about October.

Spawning tuna have been encountered on few occasions in the commercial fishery. However, large scale spawners are not normally found in the catches. It would appear that although spawning takes place to some extent in the area of commercial fishing, the majority of tuna move away, perhaps to deeper waters, just prior to spawning.

TABLE 3

Size composition of *E. affinis affinis* of Vizhingam

Months	*Minimum Length in cm.*	*Maximum Length in cm.*
July 1960	45.0	60.5
August	43.5	64.0
September	43.0	60.0
October	15.0	62.3
November	24.7	55.0
December	26.3	62.7
January 1961	30.5	62.8
February	31.7	58.5
March	24.3	62.3
April	30.1	70.1
May	42.5	67.3
June	42.5	63.7
July	48.2	66.1
August	41.6	67.3
September	42.2	61.0
October	20.3	59.0

Feeding

The composition of the food of the little tunny varies according to fluctuations in the occurrence of various food items. Its food, off Vizhingam, consists entirely of small fishes. The following food organisms were observed in the gut contents. *Leiognathus splendens, Sardinella fimbriata, Anchoviella* spp., *Dussumieria hasselti, Decapterus russelli, Rastrelliger kanagurta* and *Sepia* spp. Young clupeids are eaten to a far greater extent than other organisms. The abundance or scarcity of food organisms has no apparent connection with the fluctuations in the tuna fishery.

Remarks

The observations briefly stated above form the general picture of the fishery for the little tunny at Vizhingam. It is admitted, however, that the information given is far from adequate because of limitations involved in sampling and procuring of material.

The development of the tuna fisheries at Vizhingam has been characterized by increasing exploitation of inshore stocks. Fishing for tuna has been restricted to the inshore waters usually within 20 miles off shore. Annual landings show a gradual increase from 85.675 tonnes in 1956 to 205.768 tonnes in 1960 with a slight decline in 1959 (104.537). Catch per-unit-of effort has been considered for many fisheries as an index of population dynamics at a particular locality. Assuming that the effort has remained more or less unaltered it is seen that the total quantity of fish caught is on the increase from 1956-1960. Such increase, however, may not be accepted on

its face value as indicative of the stabilized nature of the tuna stock at present. The popular use by fishing boats of nylon drift nets in recent years might have accelerated the fishing efficiency leading to the result of larger catch. Further informative data are required to understand the actual status of the stock.

REFERENCES

U.S. DEPT. OF INTERIOR 1948. The Japanese tuna fisheries. Fishery leaflet 297, p. 60.

JONES, S. 1960. Notes on eggs, larvae and juveniles of fishes from Indian waters. V *Euthynnus affinis* (cantor). *Indian J. Fish.*, 7 (1) : 101-106.

JONES, S. AND E. G. SILAS 1960. Indian tunas—a preliminary review, with a key for their identification. *Ibid.*, 7 (2) : 369-393.