

ON THE RESOURCES OF DEMERSAL FISHES FOR BOTTOM TRAWLING IN INSHORE WATERS OFF KAKINADA BY SMALL MECHANISED BOATS

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An attempt is made to assess the available resources of demersal fishes for bottom trawling off Kakinada, in inshore waters. From the experimental fishing operation during 1964-66, the average catch per hour was 52.79 kg. for 9.13 m. (30') OAL mechanised boat. The catch composition was dominated by prawns and sciaenids forming 45% of the total catch. The average catch per trawling hour was more during the quarter April - June. An assessment on the productive depth range has indicated that the catch rate is increasing with increase in the depth of fishing.

INTRODUCTION

In view of the fact that the Indian Seas are underexploited, more emphasis is being made on the efforts to introduce modern fishing methods. Along the east coast of India, and off Andhra coast in particular, trawling as a fishing method came into existence only during the last decade. The Off Shore Fishing Station at Visakhapatnam, established to survey the fishing grounds along the east coast, concentrated its efforts mainly north of Visakhapatnam and that too in the off-shore waters. There is a lacuna in the

information about the availability of demersal fishes, both in quality and quantity in the inshore waters. In the recent years Kakinada has developed into an important fishing centre of small mechanised boats. Different workers, Narayanappa (1968 a & b), Sreekrishna (1970) and Satyanarayana *et al.* (1970) working from this base, have dealt with specific aspects of bottom trawling. In the present communication an attempt is made to provide information on the available resources of demersal fishes for bottom trawling in inshore waters.

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These observations are based on the experimental fishing operations conducted by the Central Institute of Fisheries Technology Sub-Station at Kakinada for three years, 1964 - 1966, from a small mechanised boat Fishtech No. I. described by Deshpande (1962) and Narayanappa (1968).

MATERIAL & METHODS

Bottom trawling operations were made during day time in the depth range of 5 to 35m. The fishing ground was same as noted by Sreekrishna and Narayanappa (1970) except during the month of April 1964 when fishing was done in the bay off Kakinada covered by latitude 16° - 55' N & longitude 82° E and latitude 17° N and longitude 82° E.

Two bottom trawls namely, 12.96m. (42.5') two seam cotton trawl (Satyanarayana and Nair 1962) and 11.89m. (39') two seam cotton trawl (Narayanappa 1968) were used for fishing operations. The otter boards used were of three types with varying shapes viz., (1) flat rectangular (2) horizontal curved and (3) oval as described by Mukundan *et al.* (1967).

RESULTS AND DISCUSSION

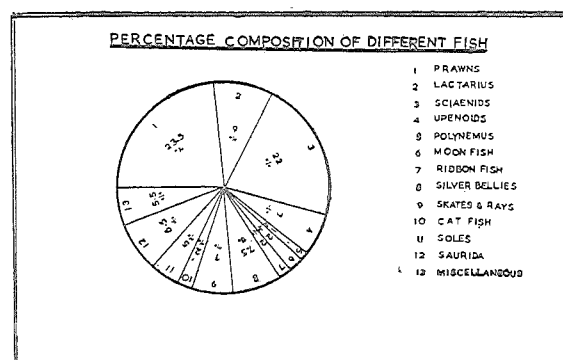
Catch rate and catch composition

The yearly fishing effort and catch per unit effort are presented in Table I.

The table indicates that in 1965, in spite of lesser number of operations, the catch per unit effort was nearly 1.5 times more than that in 1964. Further, the catch rate was nearly double that year than that of 1966, although the effort was only slightly more in the previous year. It is also evident that, though there was fluctuation of total catch per unit effort from year to year, the trend of catch rate of individual

species composition is more or less similar except during 1965 when the sciaenid catch rate is slightly more. The average catch rate of 52.79 kg. per trawling hour during 1964 - 1966 was 29.3% more than that recorded by Sebastian *et al.* (1964) during July 1963 to March 1964. However, it has to be mentioned that sporadic shoals of sciaenids, cat fish, lactarius and polynemus were met with during the period. The intensity of a shoal ranged from 208 kg. to 1624 kg. per haul and 277.3 kg. to 3,897.6 kg. per trawling hour.

Percentage catch composition for the three years is shown in Fig. 1.



Text. Fig. 1
Percentage composition of different fish.

It would be clear from the figure that though the catch was represented by a variety of demersal fishes, the dominant species were prawns and sciaenids forming nearly 45% of the total catch. The other species in the order of abundance were *lactarius*, *upenoids*, silver bellies, skates and rays, soles, *saurida* and miscellaneous fish.

Seasonal Variation of catch

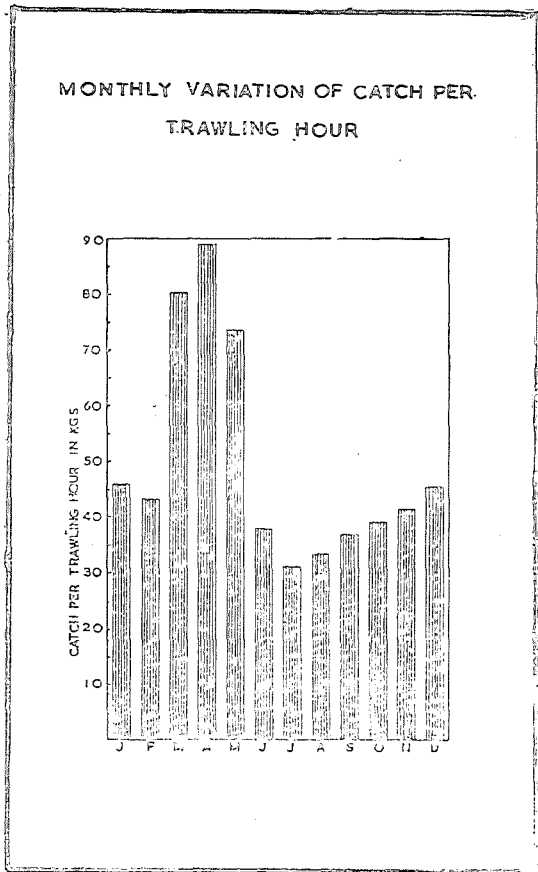
Monthly variation of catch per trawling hour on an average during 1964-66 is shown in Fig. 2. From the figure it

TABLE I
CATCH PARTICULARS DURING THE PERIOD 1964-66

Year	1964		1965		1966		1964-66	
Total fishing effort. No. of hauls/Tr. time	748/626hrs. 30min.		706/591 hrs.		667/564hrs. 30min.		2,121/1,782hrs.	
Particulars of catch	Total catch Kg.	Catch/hour	Total catch Kg.	Cach/hour	Total catch Kg.	Catch/hour	Total catch Kg.	Catch/hour
Prawn	7,587.5	12.11	8,772.0	14.84	5,900.0	10.45	22,259.5	12.48
Lactarius	2,226.5	3.55	4,813.0	8.14	1,368.5	2.42	8,408.0	4.71
Sciaenids	5,596.0	8.93	11,276.0	19.07	3,694.5	6.54	20,566.5	11.54
Upenoids	2,220.0	3.54	3,537.5	5.98	853.5	1.51	6,611.0	3.71
Polynemus	166.0	0.26	544.0	0.92	83.0	0.14	793.0	0.44
Moon fish	1,149.0	1.83	585.5	0.99	137.0	0.25	1,871.5	1.05
Ribbon fish	1,554.5	2.48	931.0	1.57	333.0	0.59	1,818.5	1.02
Silver bellies	3,008.5	4.80	2,859.5	4.82	1,199.0	2.12	7,067.0	3.96
Skates & Rays	1,192.5	1.90	3,306.0	5.59	1,843.5	3.26	6,342.0	3.56
Cat fish	160.5	0.25	1,698.0	2.87	80.5	0.14	1,940.0	1.08
Soles	1,401.0	2.23	2,155.0	3.64	1,328.0	2.35	4,884.0	2.74
Saurida	3,329.5	5.31	1,937.5	3.27	997.5	1.76	6,264.5	3.51
Others	2,422.0	3.86	1,417.5	2.39	1,422.5	2.52	5,262.0	2.95
Total	32,013.5	51.10	43,832.5	74.16	19,240.5	34.08	94,087.5	52.79

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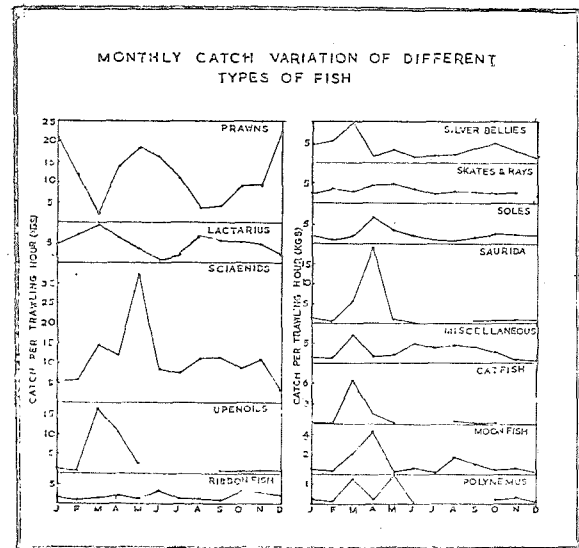
is clear that the catch per hour is beyond 30 kg. throughout the year with a peak in April, with the months of March and May following in that order.



Text. Fig. 2

Monthly variation of catch per trawling hour.

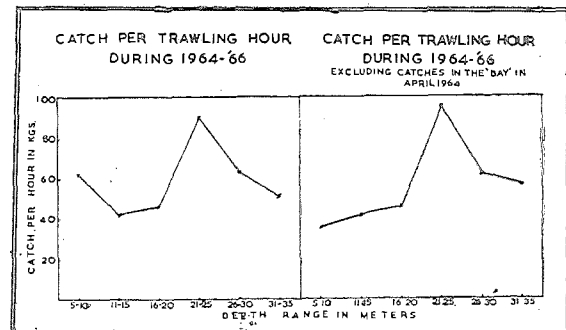
The average catch per hour calculated quarter-wise showed that the second quarter (April to June) is more productive with the catch rate of 74.05 kg./hr. The first quarter (January to March) is next with a production rate of 58.13 kg. per hour while the last quarter (October to December) occupied third place with a catch per hour of 42.57 kg. The third quarter (July to September) was the least productive and the rate was 34.23 kg. per hour.



Text. Fig. 3

Monthly catch variation of different types of fish.

Text Figure 3 showing the monthly catch per unit effort of different types of fish, indicates that almost all fish representing the bottom trawl catch were available throughout the year except upenoids, saurida, moonfish and polynemus which were not available during certain months.



Text. Fig. 4

Catch per trawling hour at different depth range.

- (a) During 1964-66
- (b) During 1964-66 (Excluding the catches in the Bay in April '64)

Further, it could be seen from the figure that the catch rate of all types of fish except prawns was at the maximum either in March, April or May. The heavy catches of Upenoids and Sciaenids in March and May have resulted in high catch per hour in these months. However, in April, good catch of majority of species was the reason for high catch rate in the month as seen from the Fig. 2. 55.59kg./hr. of saurida caught in the bay during April '64 was the reason for the good catch of this species in April.

Catch in relation to depth of fishing

With an attempt to evaluate the most productive depth range of inshore waters, the catch per trawling hour at different depth ranges is shown in Fig. 4.

It is seen that the catch per trawling hour is increasing with increase in fishing depth upto 21-25m. range beyond which the catch rate is reduced. The fall in the catch rate at higher depth range may be attributed to less fishing effort when compared with other depth ranges or it may be inferred that being a small sized trawler, the boat might not have been efficient at these depth ranges. The high catch rate at 5-10m. depth indicated in Fig. 4 (a) is mainly due to high catch rate of saurida in the day obtained during April 1964 as indicated earlier.

SUMMARY

From the bottom trawling operation from a small mechanised boat during 1964-66 an average catch of 52.79kg. per trawling hour was recorded. Though the bottom trawl catch was represented by a variety of fish, prawn and Sciaenids formed the dominant species representing more than 20% of the total catch individually. The catch

rate was found to be good, on an average, during April-June(74.05kg./hr.), followed by January-March(58.13) kg./hr., October-December (42.57 kg./hr.) and July-September (34.23 kg./hr.). The catch rate was found to be increasing with increase in the depth of fishing with a peak in 21-25m. depth range beyond which the catch rate was found to be reducing.

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