

Proceedings of the Second Workshop on Scientific Results of *FORV Sagar Sampada*

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**Department of Ocean Development
Government of India
New Delhi
1996**

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Department of Ocean Development (DOD)
Government of India
Mahasagar Bhavan, Block No-12
C.G.O. Complex, Lodi Road
New Delhi-110 003
India

ISBN : 81-900656-0-2

Citation Styles

For entire volume

Pillai, V.K. Abidi, S.A.H., Ravindran, V., Balachandran, K.K. & Agadi, V.V. (Eds.) 1996. *Proceedings of the Second Workshop on Scientific Results of FORV Sagar Sampada*, (Department of Ocean Development, New Delhi), pp. 564.

For individual article

Goswamy, S.C. & Shrivastava, Y. 1996. Zooplankton standing stock, community structure and diversity in the northern Arabian Sea, In: *Proceedings of the Second Workshop on Scientific Results of FORV Sagar Sampada*, edited by V.K. Pillai, S.A.H. Abidi, V. Ravindran, K. K. Balachandran & V.V. Agadi, (Department of Ocean Development, New Delhi), pp. 127-137.

Designed and Printed by:

Publications & Information Directorate
Council of Scientific & Industrial Research
Pusa Campus, New Delhi-110 012
India

Distribution and abundance of carangids along the EEZ India

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ABSTRACT

Distribution and abundance of carangid groups of fish along the EEZ of India based on the data collected during 80 cruises undertaken by *FORV Sagar Sampada* is presented here. East coast of India showed maximum concentration of carangids with a catch rate of 64 kg/hr along the northeast coast. The least distribution was noticed along the northwest coast (5 kg/hr). Carangids formed up to a maximum of 19 % of the total bottom trawl catch along the northwest coast. With more than 20 species of carangids reported to be caught in various cruises, *Decapterus* spp formed the most dominant group, followed by species like *Atule mate*, *Selar crumenophthalmus*, *Carangoides malabaricus* etc. Depthwise distribution showed higher density in the 60-80 m range all along the coast excepting the Andaman-Nicobar archipelago. Areawise, higher densities of carangids were noticed at latitude-longitude 7°N - 77°E, 11°N - 75°E, 11°N - 79°E, 14°N - 80°E, 18°N - 72°E, 19°N - 85°E and 19°N - 86°E. Seasonally, carangids were represented in the catch more during the monsoon especially along the northeast and southwest coasts. Potential yield of carangids along the EEZ of India is estimated to be 94971 tonne.

INTRODUCTION

The marine fishery potential of the EEZ of India has been estimated to be 4.5 x 10 tonne, of which only 1.6 x 10 tonne is currently exploited mainly from the coastal waters up to 50 m depth (James *et al.* 1989). In order to obtain the target production, it is essential that the distribution and abundance of various underexploited resources from both inshore and offshore areas are properly understood. The carangid groups of fishes with a contribution of 2 to 4% of the total marine landings in India, is one such resource whose distribution pattern beyond 50 m depth range is totally obscure except for some fractional information available on their distribution in certain sectors of the EEZ of India (Kuthalingam, *et al.* 1973; Rao *et al.* 1977; Sekharan *et al.* 1973; Bapat

et al. 1982; Reuben et al. 1989; Sudarsan et al. 1991; Sudarsan, 1993). An evaluation of the distribution pattern of the carangid fishery resource is therefore found imperative for the proper and timely exploitation of this smaller pelagic group of fishes. The present work deals with the distribution and abundance of various carangid fishes in time and space along the EEZ of India.

MATERIALS AND METHODS

Reports on the bottom trawl operations in about 80 cruises undertaken by *FORV Sagar Sampada* during 1985-90 were taken as the basis for the study. The EEZ of India is categorised into 5 zones namely the southwest (7° - 15° N, 71° 20' - 77° 30' E); northwest (15° - 23° 30' N, 67° 06' - 74° 30' E); southeast (7° 06' - 15° N, 77° 30' - 80° 40' E); northeast (15° - 20° 50' N, 80° 20' - 88° E) and Andaman- Nicobar area (06° - 14° N, 92° - 94° E). High speed demersal trawl (HSDT) and Granten Bobbin trawl were the gears used in the present study.

Catch particulars of carangids along with the total fish catch in each station were examined and the cruises operated in different months of the years under study were grouped together and average catch and catch rates reckoned in obtaining the seasonal pattern of distribution. With a view to examine the bathymetric distribution, stations operated at different depths were assorted into depth ranges of 0-20 m, 20-40 m, 40-60 m, 60- 80 m, 80 - 100 m, 100 - 150 m and above 150 m in different zones examined. Catch rate was worked out based on the total number of hours of fishing operations. Standing stock was estimated by the swept area method (Gulland, 1965). The values of standing stock thus obtained for each $10' \times 10'$ square grid surveyed in each $1^{\circ} \times 1^{\circ}$ grid area have been added up. The total value of standing stock for each zone was obtained by adding the values calculated for different $1^{\circ} \times 1^{\circ}$ grid area trawled during the period of study. Potential yield is reckoned as 60% of the standing stock.

RESULTS

Exploitation

Particulars regarding the exploitation of carangids from different zones of the EEZ of India during 1985-90 are given in Table 1. Northeast coast indicated the maximum concentration of carangids with a total catch of 9162 kg. With a catch rate of 64.831 kg/hr, the group formed 19.12 % of the zone's total fish catch. Along the southeast coast, the total carangid catch of 3212 kg (45.563 kg/hr) contributed to 8.56 % of the total trawl catch. Southwest coast, despite a maximum effort input of 221/30 hrs/min brought a total carangid catch of only 4751.2 kg (21.450 kg/hr) constituting 2.85 % of total bottom trawl catch while northwest coast of India indicated the least concentration of carangids (310.6 kg; 5.13 kg/hr). Between the two coasts, east coast had denser population of carangids (58 kg/hr; 14.48%) against that of the west coast (18

Table 1 - Catch particulars of carangids from different regions along the EEZ of India

Region	No. of cruises	No. of Stn	Total carangid catch(kg)	Catch rate (kg/hr)	Regions total catch(kg)	Carangids in tot. catch (%)
Southwest	28	238	4751	21	166885	2.85
Northwest	13	61	310	5	26017	1.19
West coast tot.	41	299	50618	17	192902	2.62
Southeast	15	58	3212	45	37499	8.56
Northeast	13	105	9162	64	47921	19.12
East coast tot.	28	163	12374	58	85420	14.48
Andaman & Nicobar	11	45	1139	30	6139	18.56

kg/hr; 2.62%). Andaman & Nicobar archipelago also indicated good concentration with a catch rate of 1139.56 kg/hr (18.56%).

Distribution

Seasonal - Catch rate of carangids caught during different months of the year along the zones under study is presented in Table 2. It may be noticed that along the southwest coast, good concentration of carangids coincided with the southwest monsoon months (May to August), with the maximum catch rate of 133 kg/hr obtained during August. While northwest coast did not indicate any seasonal pattern of distribution, east coast as a whole indicated good catches of carangids during the northeast monsoon months (October-January). Catch rates as high as 66 kg/hr and 80 kg/hr were obtained during March and January respectively along the southeast coast. However during August, a higher catch rate of 99 kg/hr was recorded along the southeast coast. This may probably be due to their migration for breeding purpose, for medium to high concentration of carangids are reported from the southern shelf including the Wadge Bank area during July/August period onwards (Rao *et al.* 1977). Along the northeast coast, a catch rate of 945 kg/hr and 142 kg/hr were recorded during February and November respectively. Along Andaman-Nicobar area also, good catches of carangids were noticed during the northeast monsoon season, with a maximum catch rate of 117 kg/hr obtained during November.

Depthwise - Particulars regarding the catch rate of carangids in different depth ranges in various zones is depicted in Fig. 1. It is noticeable that, depth range of 60-80 m indicated denser population of carangids all along the EEZ of India except along the Andaman-Nicobar area, where denser concentrations were noticed in the 80-100 m depth range. In the 60 - 80 m depth range, the maximum catch rate of 364 kg/hr was recorded from the northeast coast. Depth range of 40-60 m showed the next abundant

Table 2 - Seasonal variation of carangids(kg/hr) along the EEZ of India during 1985-90

Month	Monsoon seasons	Catch rate (kg/hr)				
		S.west	N.west	S.east	N.east	And. & Nic.
Jan.	N.east	13.00	N.op	80.00	16.80	5.10
Feb.		4.30	0.60	11.90	945.10	2.10
Mar.		20.50	N.ca.	66.10	2.90	N.op.
Apr.		14.40	N.op.	N.ca.	N.ca.	3.70
May		50.00	N.op.	N.op.	N.op.	69.50
June		69.60	N.ca.	5.90	N.op.	N.op.
July	S.west	25.60	2.50	9.30	N.op.	N.op.
Aug.		133.20	N.ca.	99.50	N.op.	N.op.
Sept.		N. ca.	1.50	N.ca.	13.80	29.00
Oct.		N.ca.	14.30	N.op.	90.40	22.40
Nov.	N. east	10.40	2.0	N.op.	142.40	117.30
Dec.		8.50	14.60	9.60	N.op.	3.00

N.ca. = No catch, N.op.= No operation

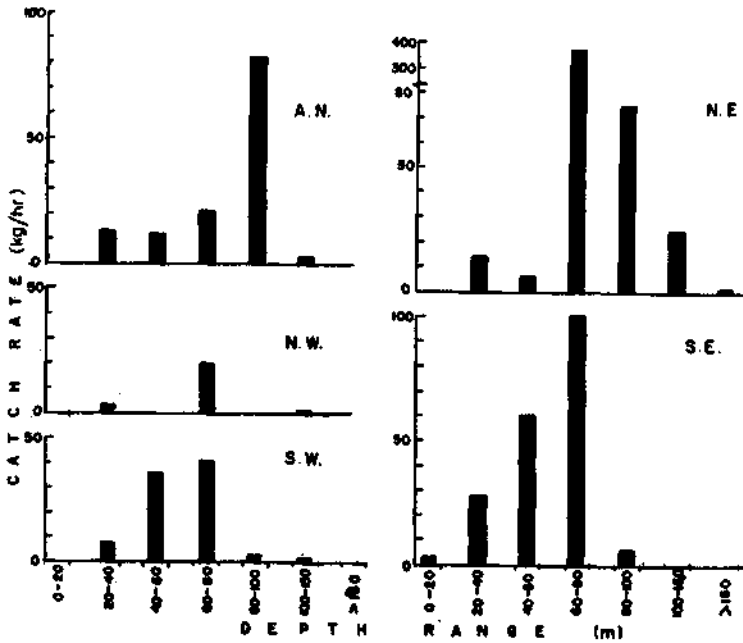


Fig. 1 - Catch rate (kg/hr) of carangids in different depth ranges in the various zones of the EEZ of India

distribution particularly along the southwest coast (36 kg/hr), southeast coast (59 kg/hr) and Andaman-Nicobar area (11 kg/hr). Concentration of carangids in the shallow waters of 20-40 m depth range was more only along the east coast including the Andaman-Nicobar area. It is interesting to note that depth range of 100 - 150 m showed distribution of carangids mainly along the northeast coast with a catch rate of 24 kg/hr. Along the Andaman-Nicobar area, 80-100 m depth range had the maximum concentration of 82.88 kg/hr of carangids.

Productive areas

Average catch rate (kg/hr) in each square grid /sub area was compared in determining the productive areas for carangids along the EEZ of India (Fig.2, Table 3). Orissa coast (19°-85°/2B: above 2000 kg/hr, 19-86°/5D : 1000 - 2000 kg/hr, 19 - 85°/3D: 200-500 kg/hr) indicated having denser population of carangids along the northeast coast. Southeast coast, though with lesser number of stations, had the Wadge Bank area (7°- 77°/5D and 11° - 79°/1A : 500-1000 kg/hr) (7°- 78°/6A , 11°- 79°/1D, 14°- 80°/2B: 200-500 kg/hr) and (7°- 77°/4°E, 8°- 76° / 1°E and 14°-80°/4B, and 1C : 100-200 kg/hr) as productive areas for carangids. In the southwest coast, Wadge Bank (7°-77°/5B : 500 - 1000 kg/hr) Cannannore (11°-75°/3B : 200-500 kg/hr), Trivandrum (8°- 76° /5C) and Mangalore (13°- 74°/3B), and (14°-73°/2F ; 100-200 kg/hr) were found productive for carangids. Northwest coast indicated sparse distribution with a concentration of 100-200 kg/hr along Bombay coast (18°-72°/6A). Along Andaman- Nicobar archipelago, sub area 11°- 92°/5E (200-500 kg/hr) was found productive for carangids.

Species composition

Zonewise- Percentage composition of different species of carangids along with the total carangid catch in different zones is presented in Table 4. It may be noticed that scads represented by *Decapterus russelli*, *Decapterus kurroides*, *D. macrosoma*, *D. lajang*, *D.macerullus* and *Decapterus* spp formed the most dominant group in all the sectors except along the northwest coast, where *Caranx* spp was the common group encountered. Scads enjoying a wider distribution all along the coast, constituted up to 90% and 88% of the total carangid catch from the northeast and southwest coasts respectively. Along Andaman-Nicobar area, *Decapterus kurroides* formed 46% of the total carangid catch. Other species of carangids represented were *Seriolina nigrofasciata* (2.21 %) along the southwest coast, *Selar mate* (17.92 %), *Carangoides malabaricus* (4.08 %) and *Caranx* spp. along the southeast coast, *Selar crumenophthalmus* (2.44 %) along the northeast coast, *Carangoides chrysophrys* (14.65 %), *Megalaspis cordyla* (2.98 %) and *S. crumenophthalmus* (11.41 %) along the Andaman-Nicobar area.

Areawise - Catch rate of different species of carangids caught from different areas in various zones is presented in (Fig. 3). It is discernible that, of the scads, *Decapterus*

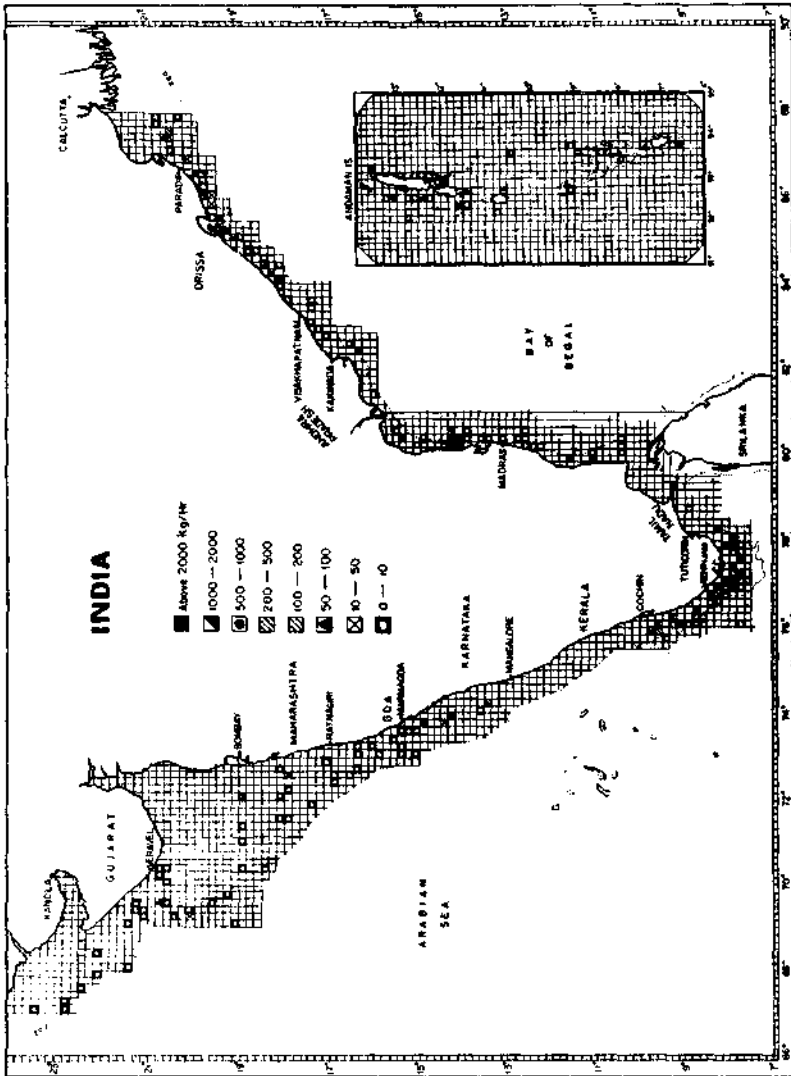


Fig. 2 - Productive areas for carangids along the EEZ of India

Table 3 - Major productive areas for carangid fishes along the EEZ of India as observed by *FORV Sagar Sampada* cruises during 1985-90

Sl.no.	Areas	Catch rate (kg/hr)	Sl.no.	Areas	Catch rate (kg/hr)
<i>1. Northeast</i>			3.	11 42 N - 92 25 E	50
1.	18 01 N - 84 07 E	79	4.	12 23 N - 92 34 E	120
2.	18 29 N - 84 23 E	200	<i>4. Southwest</i>		
3.	19 50 N - 86 31 E	1496	1.	07 56 N - 76 55 E	40
4.	19 26 N - 85 32 E	500	2.	07 48.5 N - 77 13.2 E	1340
5.	19 19 N - 85 15 E	5250	3.	07 43 N - 77 18 E	130
6.	20 30 N - 87 36 E	277	4.	08 10 N - 76 55 E	75
7.	20 31 N - 87 22 E	94	5.	08 21.4 N - 76 45.8 E	140
<i>2. Southeast</i>			6.	08 42 N - 76 27 E	120
1.	07 48 N - 77 34 E	540	7.	09 42 N - 75 53 E	140
2.	07 32 N - 77 44 E	75	8.	09 30 N - 75 53 E	195
3.	07 53 N - 78 08 E	300	9.	10 58 N - 75 31 E	131
4.	08 15 N - 78 18.6 E	200	10.	11 00 N - 75 22 E	336
5.	08 01 N - 77 58 E	145	11.	11 43 N - 74 59 E	175
6.	08 21.4 N - 76 45.8 E	140	12.	11 30 N - 75 16 E	840
7.	08 10 N - 76 55 E	75	13.	11 22 N - 75 17 E	16
8.	11 00 N - 79 00 E	1000	14.	13 30 N - 74 16 E	170
9.	11 08 N - 79 52 E	250	15.	14 12 N - 73 56 E	190
10.	14 05 N - 80 23 E	150	<i>5. Northwest</i>		
11.	14 13 N - 80 12 E	381	1.	18 58 N - 72 00 E	175
<i>3. Andaman-Nicobar</i>			2.	20 00 N - 70 56 E	25
1.	11 51 N - 92 53 E	55	3.	21 00 N - 69 20 E	30
2.	11 44 N - 92 49 E	528			

russelli was caught mainly from 7° N-77°E and 7°N - 78° E (Wadge Bank) areas along the southeast coast with a catch rate of 55 kg/hr and 600 kg/hr respectively. Along the northeast coast, *D.russelli* was obtained from 19° N - 85° E (Orissa) area, the catch rate amounting to 227 kg/hr. *D. macrosoma* was the major component in 7° N - 77° E area (101 kg/hr) along the southwest coast. *D.lajang* formed the dominant species in 11° N-79° E (250 kg/hr) area of the southeast coast. Along Andaman-

Table 4 - Species composition (%) of major species of carangids caught from different zones of the EEZ of India

Species/groups	S.west	N.west	S.east	N.east	Andm.& Nic.
<i>D.russelli</i>	17.69	0	31.6	72.86	8.81
<i>D.macerullus</i>	0	0	0	0	3.07
<i>D.kurroides</i>	0	0	0	0	46.5
<i>D.macrosoma</i>	28.44	0	0.62	0	0
<i>D.lajang</i>	0	0	31.44	0	0
<i>Decapterus</i> spp	42.13	2.96	1.1	16.35	2.5
<i>M.cordyla</i>	0.65	0	0.75	3.37	2.98
<i>Alepes djedaba</i>	0.18	0	0	0	0
<i>Alepes kalla</i>	0	0	0	0.03	0.35
<i>Atule mate</i>	0	0	17.92	0.03	0
<i>C.chrysofrys</i>	0	0	0	0.04	14.65
<i>C.malabaricus</i>	0.61	0	4.08	2.6	1.4
<i>C.armatus</i>	0	0	0	0	0.88
<i>C.oblongus</i>	0	0	0	0	0.43
<i>C.ferdau</i>	0	0	0.66	0	0.08
<i>Carangoides</i> spp	0	0	0.47	0	0
<i>Caranx ignobilis</i>	0.26	0	0	0.34	0
<i>Caranx tille</i>	0	0	0	0	0.61
<i>Caranx</i> spp	2.1	87.3	7.55	3.09	5.39
<i>S.crumenophthalmus</i>	0.42	0	0.62	2.44	11.41
<i>Selar</i> sp.	0	0	2.26	0	0
<i>S*.nigrofasciata</i>	2.21	0	0.62	0	0
Other carangids	5.24	9.45	0.25	0.84	0.08
Total carangid catch (kg)	4751.2	310.6	3212.24	9162.7	1139.56
Catch rate [kg/hr]	21.45	5.13	45.563	64.831	30.147
<i>C</i> = <i>Carangoides</i>		<i>D</i> = <i>Decapterus</i>			
<i>S</i> = <i>Selar</i>		<i>M</i> = <i>Megalaspis</i>			
<i>S*</i> = <i>Seriolina</i>					

Nicobar area *D. kurroides* formed denser concentration in the 11°- 92° area, with a catch rate of 86.67 kg/hr. Besides scads, species such as *C. chrysephrys* also formed an important component in the 13° N - 92° E area (41.75 kg/hr) in the archipelago, while along the northwest coast, *Caranx* spp. was caught from 18° N - 72° E area with a catch rate of 87.5 kg/hr.

Diurnal variation in the abundance of Scads

Catch rate of *Decapterus* spp caught from different stations of various zones is correlated with the time of trawling. The details are given in Fig. 4. It is evident that *Decapterus* spp were caught mainly during the daytime between 0600 - 1900 hrs in the evening with the maximum catch (5250 kg/hr) obtained during 1420 hrs. It may be noticed that no catch of scads was observed during night hours.

Potential yield

Particulars regarding the estimated potential yield of carangids in different depth ranges up to 150 m in various zones are given in Table 5. It may be noticed that carangids have a potential yield of 94970 tonne along the EEZ of India in a total survey area of 105640 km². Among the various zones examined, northeast coast indicated a maximum of 47095 tonne followed by southeast coast with a potential yield of 27248 tonne. The least concentration of carangids was noticeable along the northwest coast with a potential yield of 1266 tonne. However, the density of carangids per km² indicated maximum concentration of 1.760 tonne along the northeast coast, 0.786 tonne in the southeast coast and 0.588 tonne in the southwest coast, with the least distribution of 0.186 tonne along the northwest coast. Along the Andaman-Nicobar

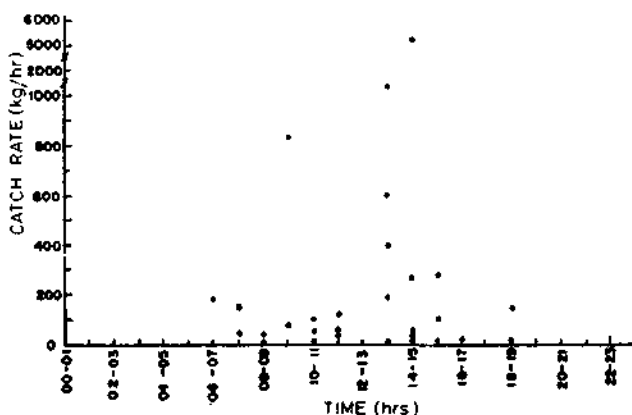


Fig. 4 - Diurnal variations in the abundance of scads caught from the EEZ of India [Multiple bars indicate different catch rates]

Table 5- Potential yield (tonne) of carangids from different depth ranges of various zones of the EEZ of India
(Values in parentheses are potential yield/km²)

Depth range(m)	Southwest (Tot.P.Y*)	Northwest (Tot.P.Y)	Southeast (Tot.P.Y)	Northeast (Tot.P.Y)	Andaman & Nicobar (Tot.P.Y)	Total P.Y.	Total area (km ²)
20-40	585.685 [0.240]	100.262 [0.097]	1039.54 [0.276]	2729.486 [0.362]	21.107 [0.062]	4476.081 [0.295]	15131
40-60	15709.68 [0.750]	26.385 [0.009]	7142.43 [0.991]	1720.574 [0.152]	397.351 [0.145]	24996.42 [0.556]	44890
60-80	10132.957 [0.777]	1134.537 [0.551]	4812.21 [1.754]	39543.607 [0.205]	29.127 [0.014]	55652.438 [2.192]	25382
80-100	622.677 [0.129]	5.277 [0.005]	216.34 [0.070]	3038.609 [1.771]	5464.251 [1.593]	9347.154 [0.665]	14063
100-150	197.883 [0.380]			63.323 [0.092]	237.46 [0.090]	498.666 [0.081]	6174
Total	27248.882 [0.588]	1266.461 [0.186]	13210.52 [0.786]	47095.59 [1.760]	6149.296 [0.689]	94970.758 [0.899]	
Tot.area [km ²]	46344	6817	16807	26754	8918		105640

*Tot.P.Y= Total potential yield (tonne)

area, the estimated potential of carangids amounted to 6149 tonne with a density of 0.689 km^2 . An average density of 0.899 tonne/km^2 of carangids is discernible from all- over the coast. Depthwise, maximum potential yield was noticed in 60-80 m range (55652 tonne) which forms about 59% of the total potential yield.

DISCUSSION

From the foregoing account, it is discernible that carangids with a concentration of 14.40 % of the total marine catch constitutes a denser population along the east coast, when compared to their contribution of 2.16 % along the west coast. It is a known fact that water mass of Bay of Bengal is warmer with pronounced estuarine influence on account of large inflow of fresh water through the major rivers. Primary productivity studies carried out along the Bay of Bengal indicate that its primary productivity though of a lesser magnitude, has certain areas like the Gulf of Mannar and Palk Bay with high rates of productivity of $2 \text{ mgC/m}^3/\text{day}$ in the nearshore waters, (Nair *et al.* 1973). It has also been shown that east coast with a comparatively less organic matter content has higher dissolved oxygen content with simultaneous abundance of phyto and zooplankton (Subrahmanyam, 1973 ; Selvaraj *et al.* 1990) indicating higher productive zones for potential fishery resources. Nevertheless, the general tendency is for a lesser rate of exploitation along the east coast, probably because of the slower rate of motorisation of boats (Balan *et al.* 1993). It is high time to realise that east coast has great potential for fish like carangids as has also been reported earlier (Virabhadra Rao, 1973; George *et al.* 1977).

The trend in marine fish production and the share of northeast coast in total India's landings during 1956-85 has revealed that there has been perceptible increase in contribution from the northeast coast over the years from 7% in 1960 to 13% in 1984-85 (George *et al.* 1977). These surveys have also indicated that purse seining and mid water trawling could be effectively employed for exploiting the surface shoaling and transitory fish species such as decapterids, horse mackerel and other carangids. In the present study also, of all the sectors of EEZ of India examined, northeast coast contributes to maximum (19.12 %) of carangids (64.83 kg/hr). This may be due to the availability of fairly wider continental shelf area of trawlable muddy/sandy bottom, along the northeast coast, with the coast off Orissa characterised by several estuarine systems of higher productivity.

A depthwise evaluation of the distribution of carangids shows that they are more concentrated in the depth range of 60 - 80 m all along the coast except along the Andaman - Nicobar area. Since it has been found that the current production within 50 m depth range forms about 87% of the estimated potential yield, (Banerji, 1973), there is limited scope for further exploitation from the inshore waters. According to Sudarsan (1993) the offshore waters of EEZ of India can sustain a potential yield of 198000 tonne of carangids which is about 85.6% of their total potential yield. Moreover, pelagic fishes are subjected to frequent migration, in response to ecological and biological factors, with the younger age group entering the coastal waters and the

older ones remaining offshore. Attempts should be made to exploit this potential pelagic stock after estimating their magnitude and abundance through acoustic surveys and test fishing.

A sharp coincidence of the seasonal abundance of carangids in different sectors with the respective monsoon season is evident in the present study. It has already been established that monsoon has a bearing on enhancing productivity, for phytoplankton thrive well in waters of low salinity. Monsoon also influences the abundance of fishery resources through upwelling, though pronounced along the southwest coast of India is also reported to occur along the east coast (Subrahmanyam, 1973).

It may be noticed that carangids catch was dominated by *Decapterus* spp in almost all the sectors of EEZ especially from waters of 60 - 80 m depth range. The trawling experiments conducted in the sea off Kakinada have shown that *Decapterus* spp are abundant beyond 50 m depth (Murthy, 1991). Good concentration of *Decapterus* spp with a potential yield of about 1000 tonne along the Wadge Bank area is reported by Sudarsan (1993). At Cochin in the carangids caught in trawl from 30 - 150 m depth range, *Decapterus* spp are reported to constitute up to 78% in the trawl catches (Sivakami, 1995). According to Rao *et al* (1997), *Decapterus* spp enjoy a wider distribution extending from 7° N - 17°E along the southwest coast of India, mainly from 20 - 80 m depth range. While the phenomenon of upwelling may have a profound influence on the abundance of scads (Muthu *et al.* 1977), the habit of these neritic species to form congregation in the bottom during day and migrating upwards to feed at night may also influence their abundance in the catches. In the present case also an evaluation of the diel variation in their catch indicates that scads were caught in trawls mainly during the daytime.

It is also noticeable from the present observations that carangids catch was poor along the northwest coast with a corresponding low catch of *Decapterus* spp. Northwest coast of India with extensive trawling grounds proved has to be the best of all the region for the demersal fishes, with pelagic fishes forming only 19.08% (George *et al.* 1977). Eventhough Arabian Sea is rich in productivity, probably influenced by the upwelling, has its effect more on the southern region, the northern shelf with comparatively high saline waters with associated low productivity may not favour pelagic fishery. Nevertheless, the earlier reports on the availability of carangids like *M.cordyla* along the Porbander and Dwaraka areas may be due to their distribution in deeper waters, for *M.cordyla* is known to be more oceanic in distribution than either scads or trevallies (Rao *et al.* 1977).

The present study indicates a wider distribution of carangids extending between 20 m and 100 m along the Andaman-Nicobar area. The distribution of carangids in the shallow waters of 20-40 m may be attributed to the productivity of these waters which range from 0.2-0.5 gC/m³/day, where the high values were recorded over the shallow waters (Kumaran, 1973). Carangids also form denser concentrations in the deeper waters of 80 - 100 m, which are beyond the reach of indigeneous crafts currently operating in this area.

Banerji (1973) has estimated an optimum annual yield of 25000 tonne of carangids from the inshore waters of Indian seas of which 21760 tonne is already exploited. Sudarsan (1993) has worked out a potential yield of 231000 tonne of carangids along the EEZ of India from the waters up to 200 m depth range. Along the northwest coast of India, this group is reported to have potential yield of 15085 tonne from waters up to 180 m depth of which about 5413 tonne is currently exploited (Reuben *et al.* 1989). Likewise, along the southwest coast of India, in a survey area extending from Gulf of Mannar to Ratnagiri, the standing stock of carangids was estimated to be 141000 tonne (Rao *et al.* 1977). Along the northwest coast of India, the biomass of *M.cordyla*, an offshore species of carangids itself amounts to 40500 tonne (Joseph & Somvanshi, 1988). In the present study, an estimated potential yield of 94970 tonne of carangids was obtained from waters up to a depth range of 150 m of the EEZ with about 59% of the potential yield obtained from 60-80 m depth range. However a comparison of the estimates by various authors may not yield a reliable picture, since the estimations are based on the gears used, depth of the area exploited, catchability coefficient adopted in the estimation and time and season of surveys conducted. Nevertheless, according to Srinath (1989), the annual yield of carangids caught within 50 m depth during 1961-85 ranged between 20000 tonne in 1968 to 59000 tonne in 1984 (excluding the island waters) thereby indicating a wide gap from the estimated potential yield, and offering further scope for exploitation of this smaller pelagic resource especially from waters beyond 50 m depth as has also been opined by Reuben *et al.* (1989) and Sudarsan (1993).

ACKNOWLEDGEMENT

Authors wish to express their deep sense of gratitude to Dr.P.S.B.R.James, former Director, for the constant encouragement.

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