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EXPERIMENTAL TRAWLING OFF VIZHINJAM*

Introduction

A knowledge of the fishery potential of all regions of the coast line is an essential prerequisite for fishing beyond the traditional coastal fishing areas, especially in the context of exploitation of the resources of the Exclusive Economic Zone. Though there have been exploratory offshore fishing activities along the southern section of the southwest coast of India in recent years, they were mainly confined to areas off Kanyakumari and Quilon. As there is no information on the demersal fishery resources of the trawling grounds of Vizhinjam area the results of experimental trawling conducted there are presented in this account.

Fishing area and methods

Experimental trawling operations were conducted north of Vizhinjam, near the southern end of Kerala coast, in the area: 8-76/3 F, between latitude 8° 20′ N and 8° 30′ N and between longitude 76° 50′ E and 77° 00′ E employing the Research Vessel CADALMIN II of the Central Marine Fisheries Research Institute during March-April 1978 (Fig. 1). The vessel is 43½′ long and is fitted with 88 HP Ashok Leyland Marine Engine, a mechanical winch, and a Simrad Echo Sounder. It has a small laboratory with a capacity to accommodate seven personnel including scientists.

Three grounds in the depth ranges of 10-20 m, 20-30 m and 30-40 m were trawled. A total of 17 hauls of one hour duration each using otter trawl with a cod end mesh of 25 mm were made. The nature of the sea bed of these grounds is sandy with a slight admixture of mud. Sea urchins, gastropod shells and crabs were the invertebrate bottom fauna noted.

The weights of the different groups of fishes obtained in each haul were taken separately from which the total catch of fish in each haul was estimated, and random samples were taken from each group of fish for measuring the length of fish caught and for noting the maturity stage and food. Total length was recorded for fish and prawns.

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*Prepared by M. D. K. Kuthalingam, G. Luther, S. Lazarus and K. Prabhakaran Nair

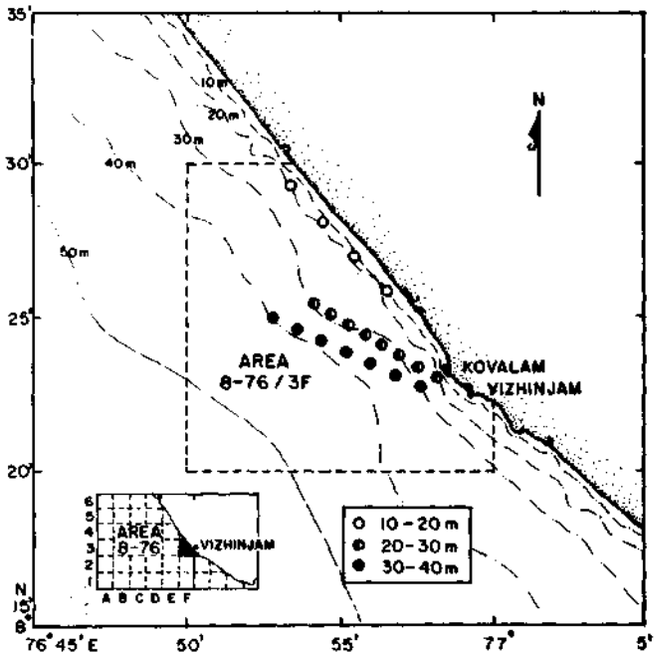

Fig. 1. Course of trawling made in fishing area 8-76/3 off Vizhinjam. Positions of trawl hauls made along the trawling track are represented by circles.

Results

The yield of fish and shell fish per hour of trawling in the different depth zones are presented in Table 1. It may be seen from the table that the total catch per hour of trawling increased steadily with increase in depth. Thus, the catch per hour was 25.2 kg at 10-20 m depth, 48.5 kg at 20-30 m depth, and 61.5 kg at 30-40 m depth. Prawns were met with only in 10-20 m depth zone and in negligible quantities during the period of observation. Though elasmobranchs were available in all the 3 depth zones, the catch rate for them was higher in 20-30 m depth. The catch rate for teleosts, however, increased with increase in depth. Crabs were more in shallower depth (10-20 m) and cephalopods in 30-40 m depth.

Table 1. *Catch per hour (in kg) for fish and shell fish in different depth zones*

Depth zone in m.	Number of hauls	Catch per hour (in kg)					
		Fish			Shell fish		Total
		Elasmobranchs	Teleosts	Prawns	Crabs	Cephalopods	
10-20	4	3.0	16.0	4.0	1.5	0.7	25.2
20-30	8	13.0	35.2	—	—	0.3	48.5
30-40	7	8.4	48.5	—	0.6	4.0	61.5

Species composition

Important species of fish and shell fish in the catches and their size ranges are as follows:

1. Prawns: *Penaeus indicus* (98-147 mm) *P. monodon* (136-153 mm)
2. Cephalopods: *Sepia pharaonis* (83-225) mm), *S. aculeata*, (45-93 m) *Loligo duvaucelii* (35-137 mm), *Doryteuthis* sp. (58-85 mm), *Octopus* spp. (220-260 mm)
3. Sharks & skates: *Loxodon macrorhinus* (400-480 mm), *Scoliodon laticaudus* (450-550 mm), *Rhynchobatus djiddensis* (450-650 mm);
4. Rays: *Himantura bleekeri* (320-410 mm), *Trygon kuhlii* (181-382 mm), *Amphotistius imbricatus* (107-155 mm), *Aetobatus narinari* (292-315 mm), *Narcine timlei* (142-155 mm).
5. Synodontid: *Saurida tumbil* (205-325 mm)
6. Congrids: *Conger cinereus* (450-525 mm) *Uroconger lepturus* (420-515 mm).
7. Fistularid: *Fistularia villosa* (300-450 mm)
8. Carangids: *Caranx malabaricus* (120-160 mm), *C. williamsi* (164-195 mm), *C. chrysophrys* (175-195 mm), *C. djedaba* (110-140 mm), *C. sexfasciatus* (110-135 mm), *C. melampygus* (145-175 mm), *Selar kalla* (80-120 mm), *Megalaspis cordyla* (280-330 mm), *Decapterus dayi* (110-175 mm), *Alectis indica* (302-310 mm).
9. Nemipterids: *Nemipterus japonicus* (230-265 mm), *N. bleekeri* (96-200 mm).
10. Leiognathids: *Leiognathus bindus* (65-85 mm), *L. lineolatus* (60-75 mm), *Secutor insidiator* (52-85 mm), *S. ruconius* (50-75 mm).

Table 2. *Depthwise distribution of different categories of fish and shell fish (%) and ranges of salinity and temperature in the trawling grounds during March-April 1978*

Depth zone (m)	Prawns	Cephalopods	Sharks	Rays & Skates	Synodontids	Congrids	Fistularid	Carangids	Nemipterids	Platycephalid	Psettodid	Bothid	Cynoglossid	Balistids	Diodontids	Leiognathids	Sciaenids	Trichiurid	Miscellaneous	Salinity (ppt) Surface	Salinity (ppt) Bottom	Temperature (°C) Surface	Temperature (°C) Bottom
10-20	12.5	2.8	5.6	6.9	5.6	13.9	4.2	9.7	11.1	8.3	—	—	—	—	5.6	8.3	5.6	—	—	30.01 to 35.64	30.52 to 36.67	30.0 to 31.5	28.4 to 29.0
20-30	—	0.5	1.6	24.8	1.1	0.2	5.9	4.1	5.0	0.5	0.2	0.2	1.6	1.1	45.2	1.4	—	0.5	5.2				
30-40	—	6.9	6.2	7.6	2.4	—	20.2	—	2.1	—	0.9	1.9	6.7	4.3	33.8	2.1	—	—	4.9				

11. Sciaenids: *Johnius dussumieri* (140-180 mm), *Otolithus ruber* (250-285 mm).
12. Trichiurid: *Trichiurus lepturus* (450-460 mm).
13. Platycephalid: *Grammoplites scaber* (114-210 mm)
14. Psettodid: *Psettodes erumei* (400-465 mm)
15. Bothid *Pseudorhombus javanicus* (277-315 mm)
16. Cynoglossid: *Cynoglossus semifasciatus* (40-145 mm)
17. Balistids: *Sufflamen capistratus* (135-164 mm), *Odonus niger* (124-135 mm)
18. Diodontids: *Diodon hystrix* (150-175 mm), *D. maculifer* (120-135 mm); *D. holacanthus* (100-120 mm)
19. Miscellaneous: *Lactarius lactarius, Lethrinus* spp., *Therapon jarbua, Sphyraena obtusata, Polynemus* spp., *Pampus argenteus, Tachysurus* spp., *Tetrasomus concatinatus, Arothron stellatus, Epinephelus* sp., *Triacanthus brevirostris, Gerres* spp., *Apogon enneastigma, Parapercis pulchella, Canthigaster margaritatus, Antennarius* sp., *Dactyloptena orientallis, Siganus oramin, S. javus* and *Thenus orientallis.*

Mature gonads (in stages IV-VI ICES) were noticed in *Decapterus dayi, Caranx melampygus, Caranx chrysophrys, Sphyraena obtusta, Fistularia villosa, Grammoplites scaber* and *Psettodes erumei.*

Prawns and squids formed the principal food of *Fistularia villosa* and *Nemipterus bleekeri.* Early juveniles of *Leiognathus, Nemipterus* and *Stolephorus* formed the main food of *Alectis indica, Caranx melampygus, Caranx chrysophrys, Nemipterus japonicus, Grammoplites scaber* and *Otolithus ruber. Stolephorus* formed the exclusive food item of *Sphyaerna obtusata* and *Squilla* formed the chief food of *Gerres limbatus* during the period of observation.

Remarks

Each depth zone was found to be dominated by certain groups of fish and shell fish (Table 2). Thus, in the 10-20 m depth zone congrid eels, prawns, nemipterids, carangids, leiognathids, and platycephalid ranked high. Similarly diodontids and rays were dominant in the 20-30 m depth zone in comparison with the other two depth zones. Apart from diodontids, *Fistularia villosa,* was the most dominant species in the 30-40 m depth zone. These comparisons of the dominant catches in the three depth zones indicate that (1) quality fishes are abundant in 10-20 m zone, (2) diodontids dominate the catches in 20-30 m and 30-40 m depth zones, (3) rays and skates are relatively more abundant in 20-30 m depth zone, (4) cephalopods, fistularids and flat fishes are common in the 30-40 m depth zone and (5) prawns are present only in 10-20 m depth zone.

The overall picture emerging from the present experimental trawling operations is that of a steady increase in the catch per hour with increase in depth upto 40 m area during March-April period. The results are quite encouraging and indicate the availability of trawlable quantities of demersal fishes in these grounds. However, more intensive trawling should be attempted during different seasons in order to assess the potentiality of these trawling grounds.