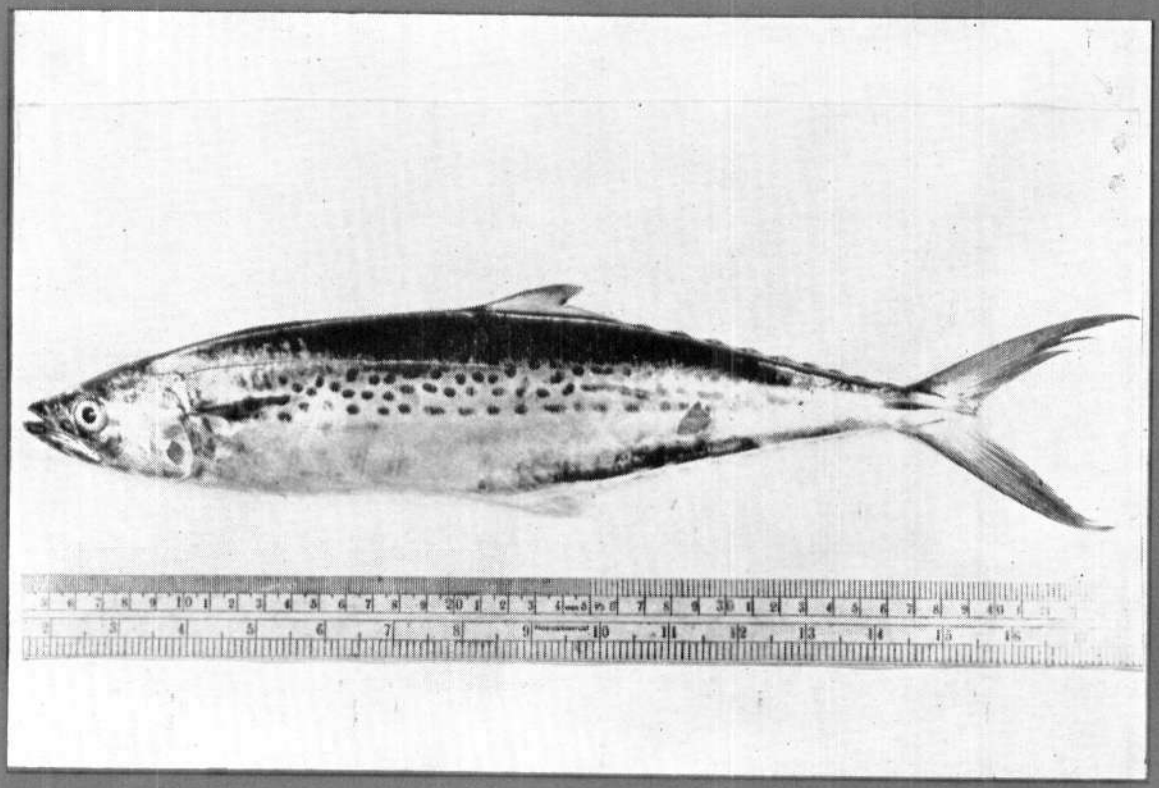
MARINE FISHERIES INFORMATION SERVICE



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Technical and Extension Series

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
COCHIN, INDIA

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

THE MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the National Marine Living Resources Data Centre (NMLRDC) and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

Abbreviation - *Mar. Fish. Infor. Serv., T & E Ser.,* No. **81**: 1988

MARINE FISH CALENDAR

3. CALICUT*

M. Kumaran, T. M. Yohannan and Feroz Khan

Calicut Research Centre of CMFRI, Calicut

Introduction

Investigations on the resource characteristics of some commercially important pelagic as well as demersal fishes, prawns and molluscs are being carried out at the Calicut Research Centre of Central Marine Fisheries Research Institute. The Kerala coast being an important contributor of major species of pelagic fish resources like oil sardine and mackerel, emphasis is given on the investigations of potential stocks of the above resources. Resource characteristics of pelagic fishes like tuna, seer fish, bill fish, pomfret and demersal fishes like cat fish, sole *etc.* are also being regularly monitored for distribution and abundance in space and time.

The major portion of the fish landed at the Calicut fish landing centre is that exploited by country crafts with indigenous gears like boat seines, drift net, gill net and hooks and line and only 13.2% (800 tonnes) is by trawling by mechanised boats. Analysis of the fish landings for the years 1981–'86 shows that the average total landing was 6,053.5 tonnes of which about 70% (4,235.2 tonnes) was by boat seines alone, drift net contributing 6.6% (401.4 tonnes), hooks and line 5.8% (350.1 tonnes) and gill net 4.4% (266.8 tonnes). In the drift net catches the CPUE of different species are found to be maximum during July. This being the peak monsoon month, the effort is generally very low. Perhaps this can be the reason for high CPUE values. Still the possibility of increased availability of these species during the monsoon months cannot be ruled out as drift net units do not venture to go for fishing during monsoon due to bad weather.

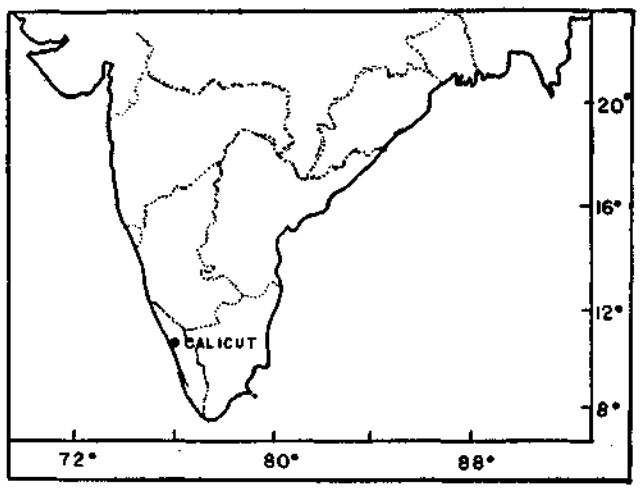
The important groups contributing to the fishery at Calicut are clupeids (3,322 tonnes), anchovies (383 tonnes), seer fishes, mackerel and tunas (363 tonnes), soles (291 tonnes), cat fishes (257 tonnes), pomfrets (65 tonnes) and elasmobranchs (26 tonnes).

Clupeids forming 54.9% are exploited by boat seines which contribute 96.1% and the gill net which contributes 3.9% of the total clupeid landings. The annual yield of oil sardine *Sardinella longiceps* which is the most important species among clupeids having wide fluctuations from year to year and with an average of 3,288 tonnes, has been showing generally a declining trend in recent years. Fishes of 0-year class contribute to a major portion of the catch. As maturity progresses to a size of 14 cm, with the onset of the monsoon there is a seaward breeding migration. The fishery being restricted to the narrow coastal belt extending to about 10 km from the shore is exclusively exploited by artisanal fishermen using indigenous crafts and gears. The gradual decline in the yield along the Malabar coast may be attributed to the widespread operation of purse seiners along both south and north of this part of the coast as it restricts movement of shoals and adversely affects spawning.

Anchovies forming 6.3% in the total landings are exploited by boat seines (83.6%) and trawl net (16.4%).

Scombroids which form 6.0% in the total catch are exploited mostly by drift net (45.3%), boat seines (34.4%) and gill net (19.9%). The Indian mackerel *Rastrelliger kanagurta* forming 208.8 tonnes on an average is exploited by gill net, boat seines and drift net. This resource also shows wide fluctuations in the yield with a maximum catch of 709 tonnes in 1980 which gradually declined in 1983. The yield trend in the subsequent years steadily improved with a crust in 1985 (385 tonnes). The peak fishing season for mackerel which occurs from 5 to 40 m depth is from August to October. Seerfishes *Scomberomorus commerson* and *S. guttatus* contributing 89.6 tonnes per year on an average are mainly landed by drift net. The peak period of abundance is from October to December,

*Consolidated by N. Gopinatha Menon and K. Balachandran, CMFRI, Cochin.



but the spawning is during April–May. The average annual catch of tunas is 64.2 tonnes which are exclusively landed by drift net. The dominant species is the little tunny *Euthynnus affinis* and the fishing season extends from March to May. Fairly offshore waters from 30–50 m is the region of abundance of tunas.

Soles form on an average 4.8% in the total landings and is exploited by trawl net, boat seine and gill net and the most important commercial species is the Malabar sole *Cynoglossus macrostomus*.

Cat fish forming 4.3% in the total landings is an important component in the demersal fishery resources and is exploited by hooks and line, drift net and trawl net. *Tachysurus dussumieri*, *T. thalassinus*, *T. tenuispinis* and *T. serratus* are the most important species forming the commercial fishery. Cat fish constitutes 57.0% in the landings of hooks and line and 15.2% in drift net landings. The trend of this resource showed fluctuations from year to year with a general decreasing trend in the past one or two years. The peak period of the fishery generally coincides with the peak breeding season, often with mass destructions of gestating males leading to mass mortality of eggs/embryos.

The pomfrets forming 1.1% of the total landings are exploited by drift net, boat seine and trawl net. The black pomfret *Parastromateus niger* and silver pomfret *P. argenteus* are the species involved and the former forms about twice that of the latter in the fishery. Pomfrets constitute 9.0% in the landings of drift net, 0.8% in the trawl net and 0.5% in boat seines.

Sharks, skates and rays together form only 0.42% in the total landings and are mainly landed by hooks and line and drift net. Other demersal resources like ribbon fishes, threadfin breams, sciaenids, silver bellies and lizard fishes also form a fishery of some importance in the Calicut region.

CLUPEIDAE

Popular English Name	:	Sardines
Vernacular Name (Malayalam)	:	'Mathi'/'Chala'/ 'Mathichala'
Annual average catch	:	3,322 t
Percentage in total catch	:	54.88
Fishing methods and their contribution	:	Boat seine/Gill net
		Boat seine : 96.09%
		Gill net : 3.91%

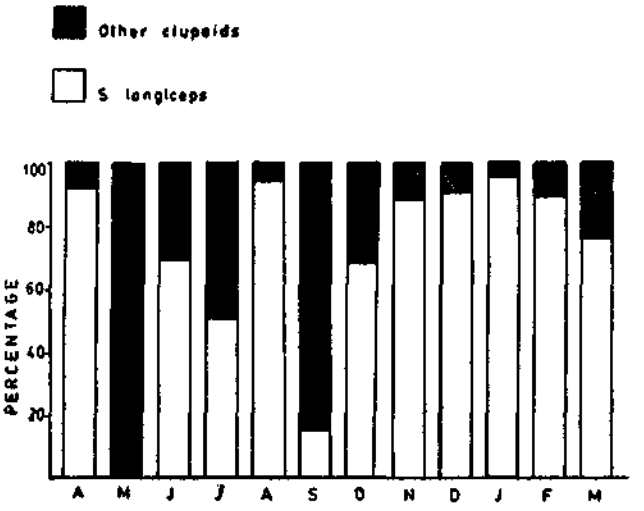


Fig. 1. Monthwise species composition of clupeids by gill net.

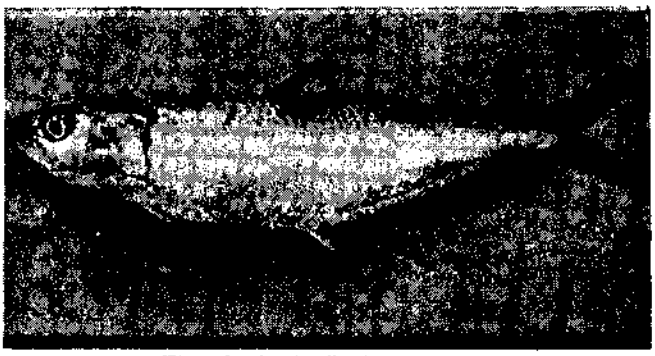


Fig. 2. *Sardinella longiceps*.

Scientific Name	:	*Sardinella longiceps*
Vernacular Name	:	'Mathi'
Gear	:	Boat seine/Gill net
Percentage composition in the gear	:	Boat seine : 74.85
		Gill net : 39.43
Peak period of occurrence	:	Sept. – Feb.
Depth of occurrence	:	5 – 15 m

Length range in commercial fishery : 130 – 210 mm
Size at first maturity : 140 mm
Spawning season : Jun. – Aug.

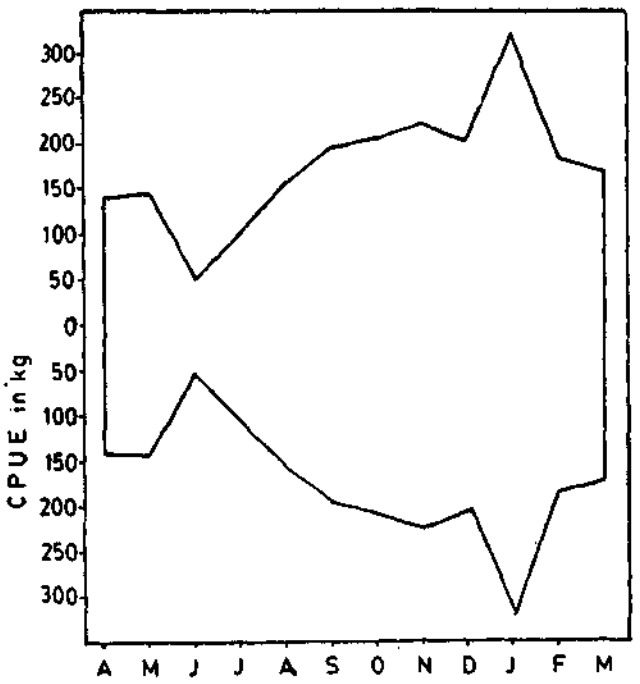


Fig. 3. Seasonal abundance of oil sardine in boat seine.

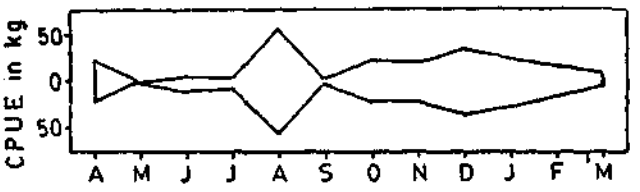


Fig. 4. Seasonal abundance of oil sardine in gill net.

CYNOGLOSSIDAE

Popular English Name : Sole/Tongue sole/ Malabar sole
Vernacular Name (Malayalam) : 'Mantha'
Annual average catch : 290.9 t
Percentage in total catch : 4.8
Fishing methods and their contribution : Trawl net/Boat seine/ Gill net
Trawl net : 90.87%
Boat seine : 6.72%
Gill net : 2.41%

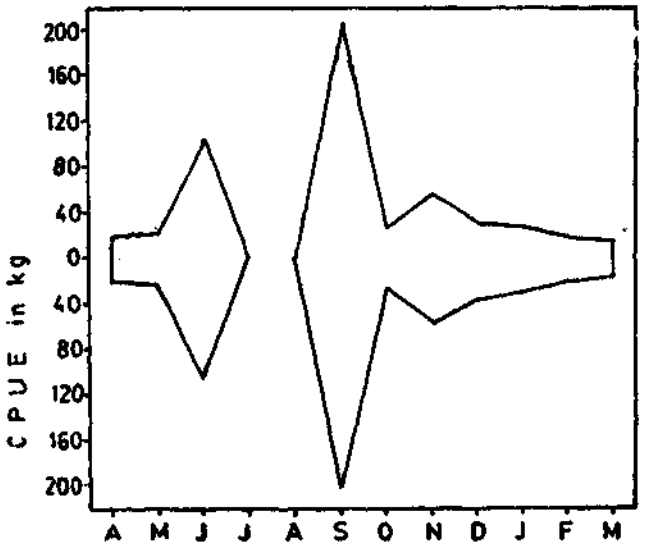


Fig. 5. Seasonal abundance of cynoglossids in trawl net.

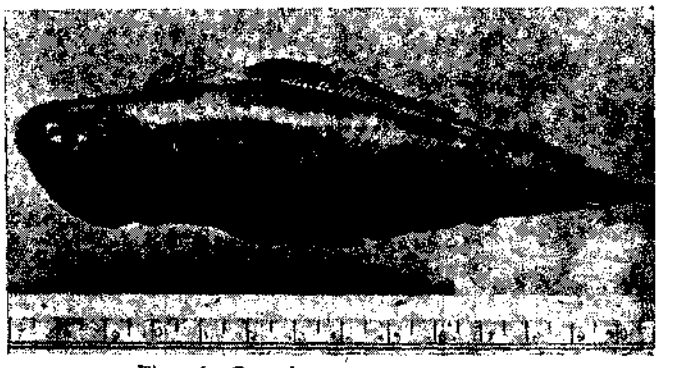


Fig. 6. *Cynoglossus macrostomus*.

Scientific Name : *Cynoglossus macrostomus*
Vernacular Name : 'Mantha'
Gear : Trawl net/Boat seine/ Gill net
Percentage composition in the gear : Trawl net : 33.00
Gill net : 2.41
Boat seine : 0.46
Peak period of occurrence : Nov. - Feb.
Depth of occurrence : Upto 10 m
Length range in commercial fishery : 40 – 160 mm
Size at first maturity : 120 mm
Spawning season : Oct. – Jan.

ELASMOBRANCHS

Popular English Name : Sharks/Skates/Rays
Vernacular Name (Malayalam) : 'Sravu'/'Koithala'/ 'Thirandi'
Annual average catch : 25.69 t

Percentage in total catch : 0.42
Fishing methods and their contribution : Hooks and line/Drift net
Hooks and line : 93.44%
Drift net : 6.56%

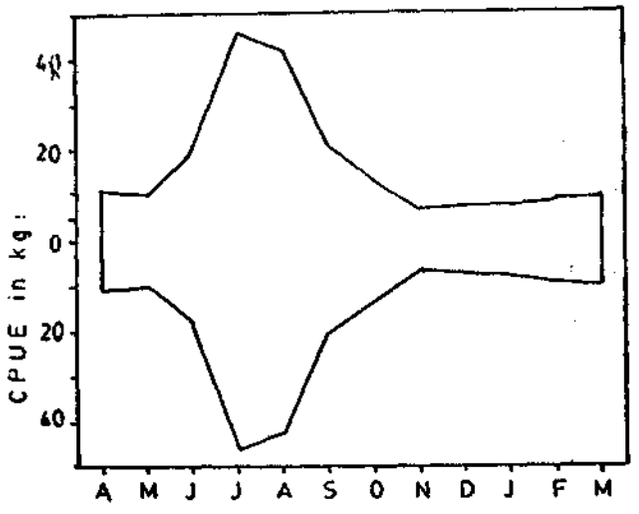


Fig. 7. Seasonal abundance of elasmobranchs in drift net.

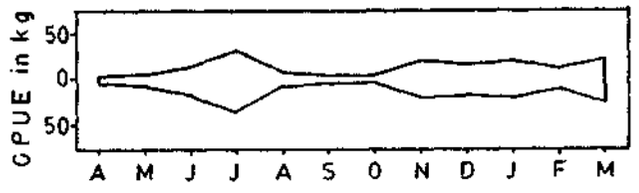


Fig. 8. Seasonal abundance of elasmobranchs in hooks and line.

ENGRAULIDAE

Popular English Name : Anchovy
Vernacular Name (Malayalam) : 'Nethal'/'Netholi'
Annual average catch : 383.27 t
Percentage in total catch : 6.33
Fishing methods and their contribution : Boat seine/Trawl net
Boat seine : 83.6%
Trawl net : 16.4%

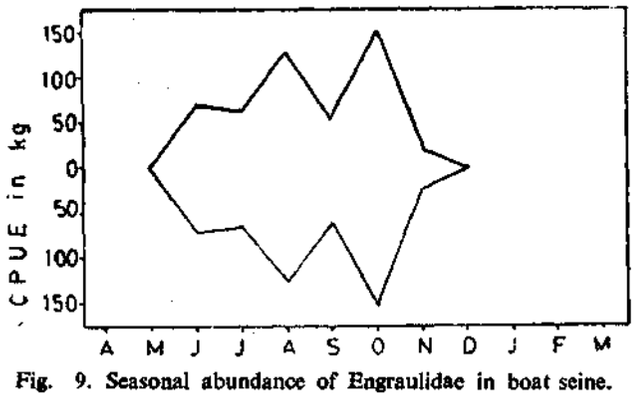


Fig. 9. Seasonal abundance of Engraulidae in boat seine.

Fig. 10. Seasonal abundance of Engraulidae in trawl net.

SCOMBRIDAE

Popular English Name : Seer fishes/Indian mackerel/Tunas
Vernacular Name (Malayalam) : 'Ayakkura'/'Ayila'/'Sootha'/'Varimeen'/'Choora'
Annual average catch : 362.7 t
Percentage in total catch : 5.99
Fishing methods and their contribution : Drift net/Boat seine/Gill net/Trawl net
Drift net : 45.32%
Boat seine : 34.42%
Gill net : 19.88%
Trawl net : 0.39%

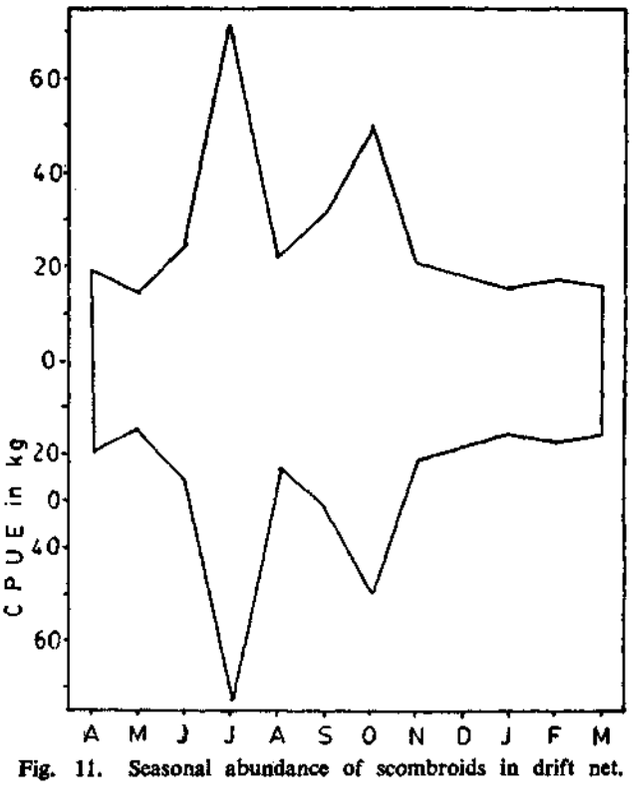


Fig. 11. Seasonal abundance of scombroids in drift net.

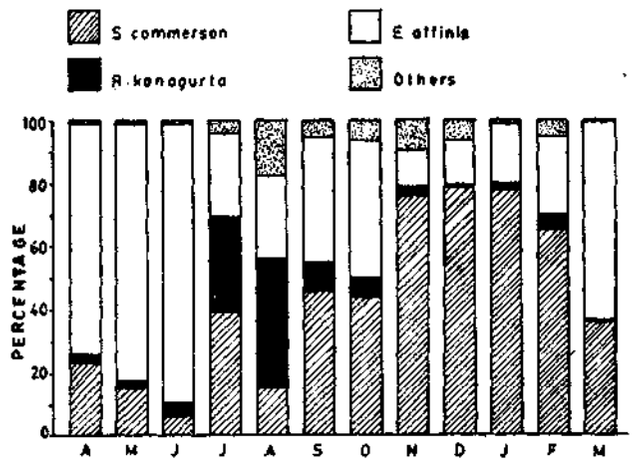


Fig. 12. Monthwise species composition of scombroids in drift net.

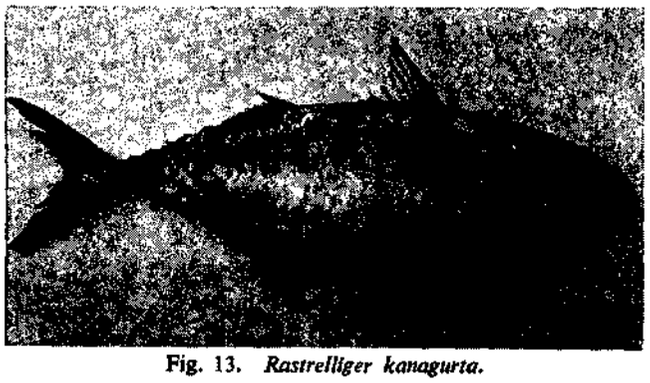


Fig. 13. *Rastrelliger kanagurta.*

Scientific Name	:	*Rastrelliger kanagurta*
Vernacular Name (Malayalam)	:	'Ayila'
Gear	:	Gill net/Boat seine/ Drift net
Percentage composition in the gear	:	Gill net : 27.02 Boat seine : 2.98 Drift net : 2.62
Peak period of occurrence	:	Aug. - Oct.
Depth of occurrence	:	5 - 40 m

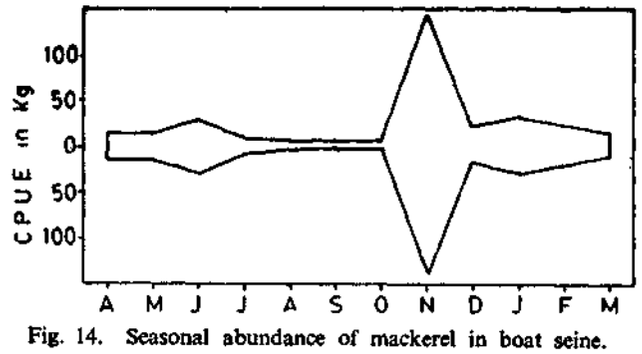


Fig. 14. Seasonal abundance of mackerel in boat seine.

Length range in commercial fishery	:	180 - 220 mm
Size at first maturity	:	200 mm
Spawning season	:	May to August.

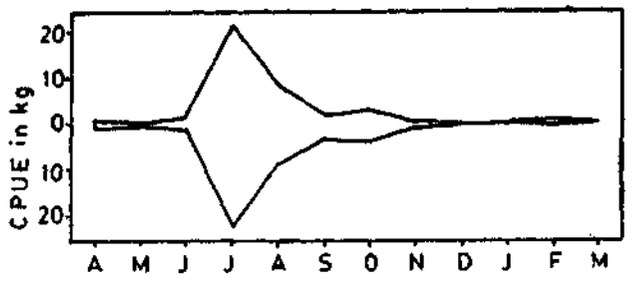


Fig. 15. Seasonal abundance of mackerel in drift net.

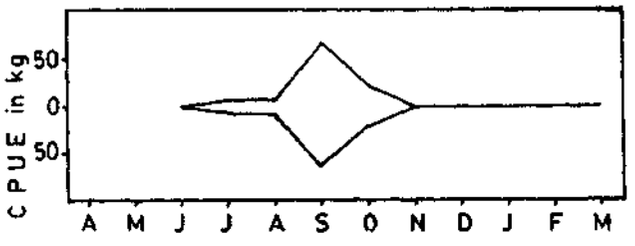


Fig. 16. Seasonal abundance of mackerel in gill net.

SEER FISHES

Popular English Name	:	Seer fishes
Vernacular Name (Malayalam)	:	'Varimeen'/'Ayakkura'
Annual average catch	:	89.6 t
Percentage in total catch	:	22.3
Fishing methods and their contribution	:	Drift net

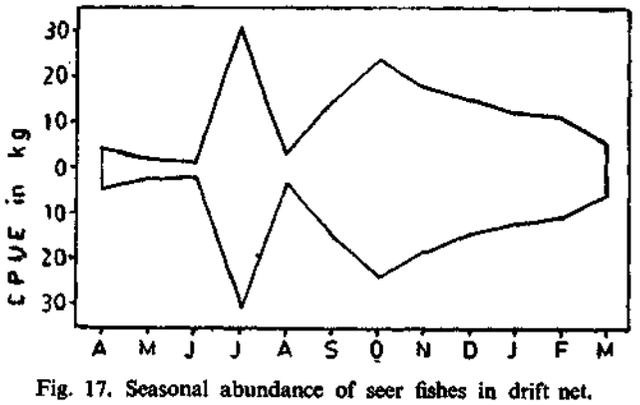


Fig. 17. Seasonal abundance of seer fishes in drift net.

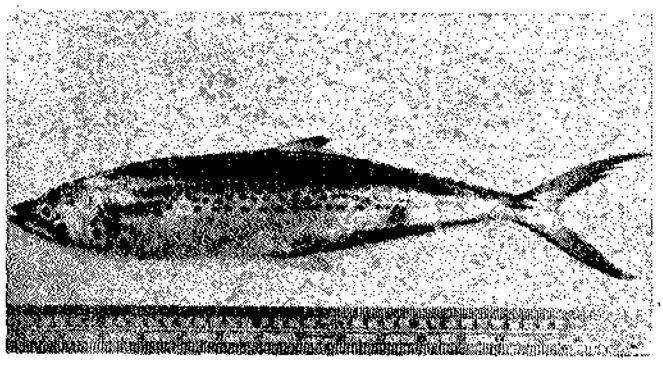


Fig. 18. *Scomberomorus guttatus.*

Scientific Name	:	*Scomberomorus guttatus*
Vernacular Name	:	'Varimeen'
Gear	:	Drift net
Percentage composition in the gear	:	Drift net : 1.04
Peak period of occurrence	:	Oct. – Nov.
Depth of occurrence	:	20 – 50 m
Length range in commercial fishery	:	300 – 600 mm
Size at first maturity	:	410 mm
Spawning season	:	April – May

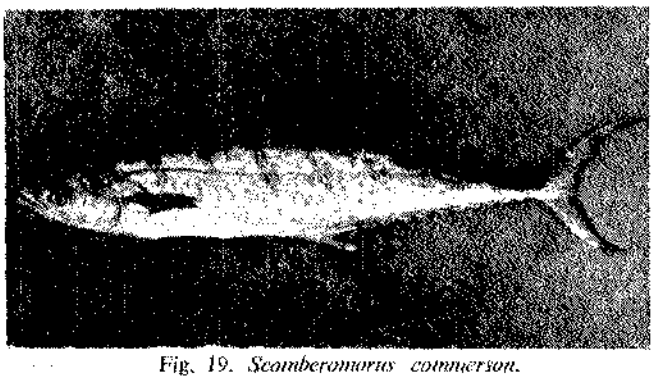


Fig. 19. *Scomberomorus commerson.*

Scientific Name	:	*Scomberomorus commerson*
Vernacular Name	:	'Ayakkura'
Gear	:	Drift net
Percentage composition in the gear	:	Drift net : 21.30
Peak period of occurrence	:	Oct. – Dec.
Depth of occurrence	:	20 – 50 m
Length range in commercial fishery	:	500 – 800 mm
Size at first maturity	:	750 mm
Spawning season	:	April – May

TUNA

Popular English Name	:	Tuna
Vernacular Name (Malayalam)	:	'Sootha'/'Choora'
Annual average catch	:	64.2 t
Percentage in total catch	:	—
Fishing methods and their contribution	:	Drift net : 16%

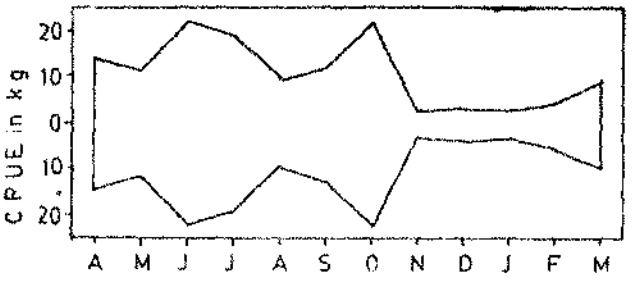


Fig. 20. Seasonal abundance of tunas in drift net.

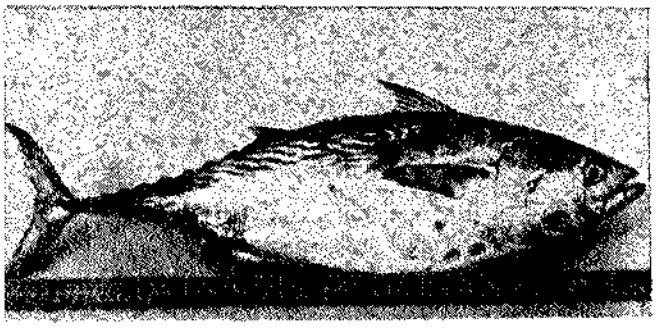


Fig. 21. *Euthynnus affinis.*

Scientific Name	:	*Euthynnus affinis*
Vernacular Name	:	'Sootha'/'Choora'
Gear	:	Drift net
Percentage composition in the gear	:	Drift net : 14.94
Peak period of occurrence	:	March – May
Depth of occurrence	:	30 – 50 m
Length range in commercial fishery	:	300 – 500 mm
Size at first maturity	:	430 mm
Spawning season	:	Sep. – Oct.

STROMATEIDAE

Popular English Name	:	Black pomfret/Silver pomfret
Vernacular Name (Malayalam)	:	'Avoli'
Annual average catch	:	64.7 t
Percentage in total catch	:	1.07
Fishing methods and their contribution	:	Drift net/Boat seine/ Trawl net Drift net : 55.76% Boat seine : 33.47% Trawl net : 10.77%

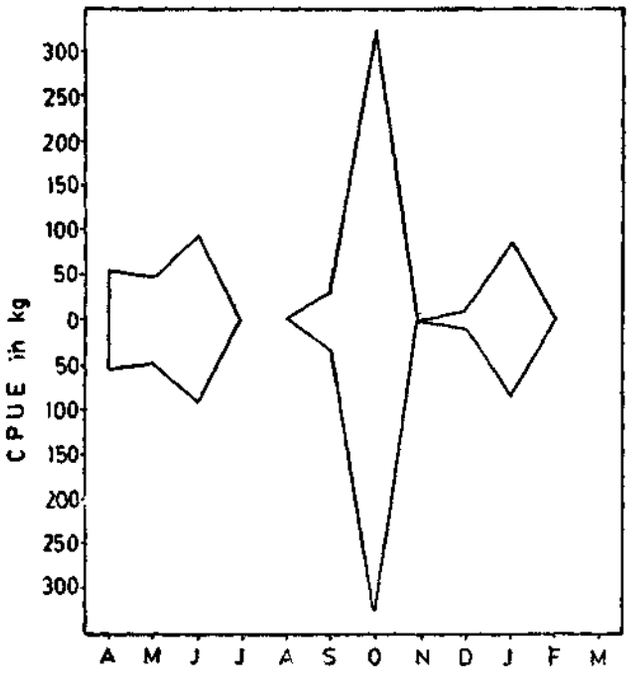


Fig. 22. Seasonal abundance of pomfrets in boat seine.

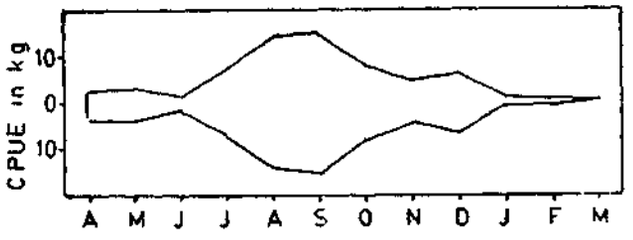


Fig. 23. Seasonal abundance of pomfrets in drift net.

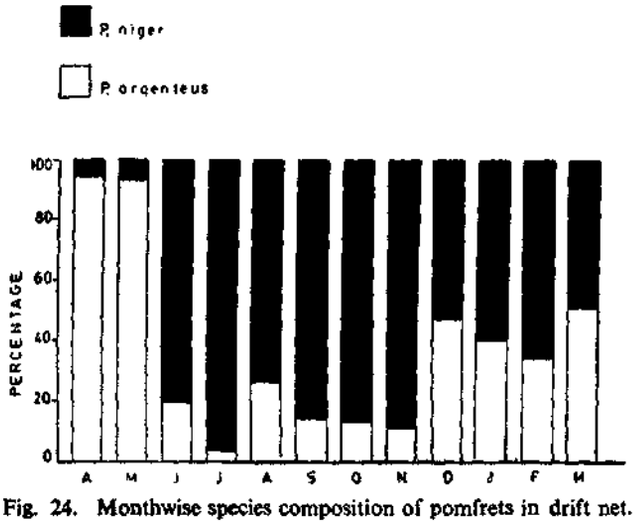


Fig. 24. Monthwise species composition of pomfrets in drift net.

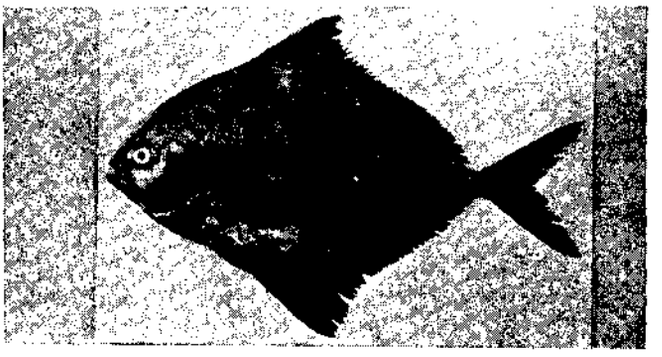


Fig. 25. *Parastromateus niger.*

Scientific Name	:	*Parastromateus niger*
Vernacular Name	:	'Karutha avoli'
Gear	:	Drift net/Boat seine
Percentage composition in the gear	:	Drift net : 6.06 Boat seine : 0.51
Peak period of occurrence	:	Sep. - Dec.
Depth of occurrence	:	15-40 m
Length range in commercial fishery	:	230-350 mm
Size at first maturity	:	300 mm
Spawning season	:	July-Oct.

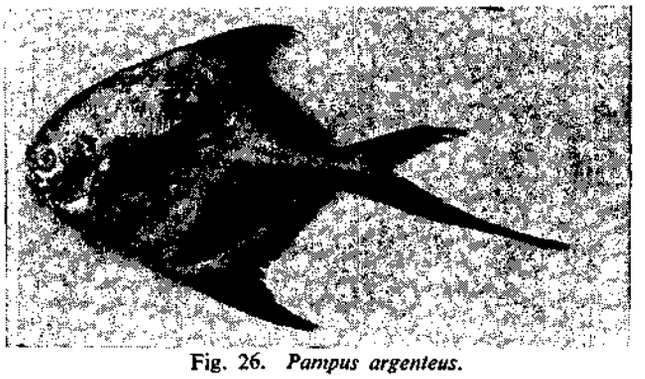


Fig. 26. *Pampus argenteus.*

Scientific Name	:	*Pampus argenteus*
Vernacular Name	:	'Vella avoli'
Gear	:	Drift net/Trawl net
Percentage composition in the gear	:	Drift net : 2.92 Trawl net : 0.85
Peak period of occurrence	:	Nov. - Jan.
Depth of occurrence	:	10-40 m
Length range in commercial fishery	:	160-250 mm
Size at first maturity	:	220 mm
Spawning season	:	May-Sep.

TACHYSURIDAE

Popular English Name : Cat fish
Vernacular Name
(Malayalam) : 'Etta'
Annual average catch : 257.18 t (1981–'86)
Percentage in total catch : 4.3

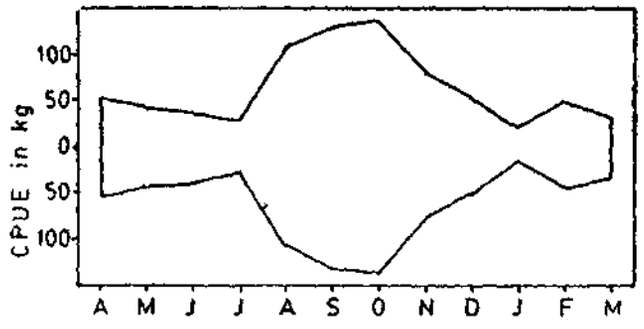


Fig. 27. Seasonal abundance of cat fishes in hooks and line.

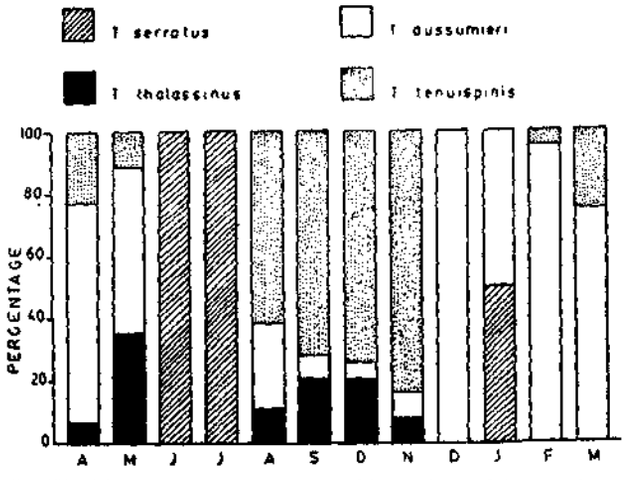


Fig. 28. Monthwise species composition of cat fishes in hooks and line.

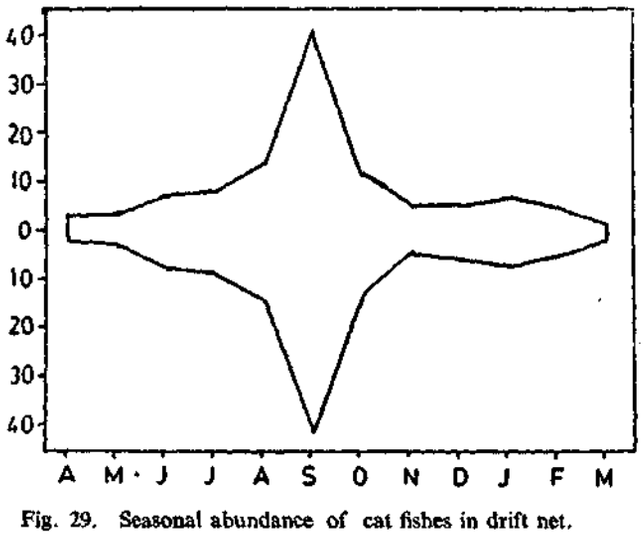


Fig. 29. Seasonal abundance of cat fishes in drift net.

Fishing methods and
their contribution : Hooks and line/Drift net/
Trawl net
Hooks and line: 73.08%
Drift net : 23.14%
Trawl net : 3.78%

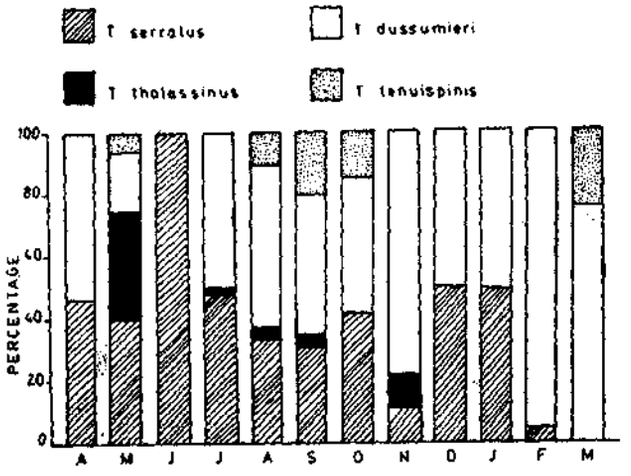


Fig. 30. Monthwise species composition of cat fishes in drift net.

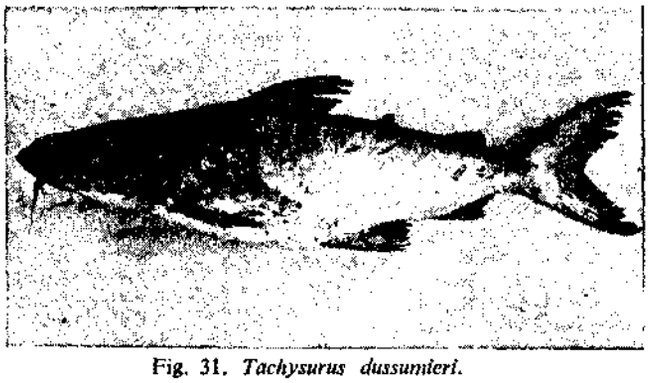


Fig. 31. *Tachysurus dussumieri.*

Scientific Name : *Tachysurus dussumieri*
Vernacular Name : 'Valiyetta'
Gear : Hooks and line/
Drift net
Percentage composition
in the gear : Hooks and line : 14.89
Drift net : 5.91
Peak period of occurrence : Mar. – May
Depth of occurrence : 15–40 m
Length range in
commercial fishery : 500–1,000 mm
Size at first maturity : 500 mm
Spawning season : April–Aug.

Fig. 32. *Tachysurus thalassinus.*

Scientific Name	:	*Tachysurus thalassinus*
Vernacular Name	:	'Thuriyetta'
Gear	:	Hooks and line/ Drift net
Percentage composition in the gear	:	Hooks and line : 11.11 Drift net : 0.27
Peak period of occurrence	:	Aug. – Oct.
Depth of occurrence	:	25 – 60 m
Length range in commercial fishery	:	170 – 600 mm
Size at first maturity	:	280 mm
Spawning season	:	Apr. – Aug.

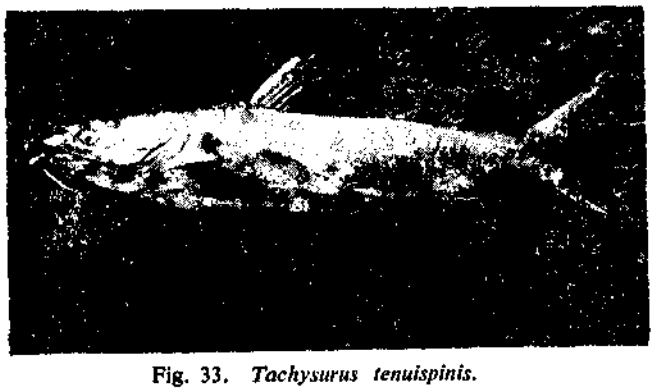


Fig. 33. *Tachysurus tenuispinis.*

Scientific Name	:	*Tachysurus tenuispinis*
Vernacular Name	:	—
Gear	:	Hooks and line/ Drift net/Trawl net
Percentage composition in the gear	:	Hooks and line : 27.46 Drift net : 7.15 Trawl net : 1.22
Peak period of occurrence	:	Sep. – Mar.
Depth of occurrence	:	35 – 60 m
Length range in commercial fishery	:	230 – 400 mm
Size at first maturity	:	280 mm
Spawning season	:	May – Sep.

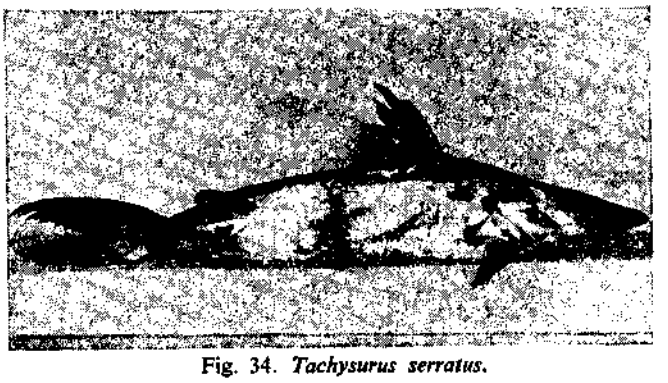
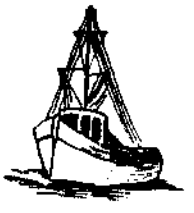


Fig. 34. *Tachysurus serratus.*

Scientific Name	:	*Tachysurus serratus*
Vernacular Name	:	'Navetta'
Gear	:	Hooks and line/ Drift net
Percentage composition in the gear	:	Hooks and line : 3.50 Drift net : 1.82
Peak period of occurrence	:	Sep. – Dec.
Depth of occurrence	:	25 – 40 m
Length range in commercial fishery	:	600 – 1,000 mm
Size at first maturity	:	600 mm
Spawning season	:	April – July



POTENTIALITIES OF MUTTUKADU MARICULTURE FARM FOR GREEN MUSSEL CULTURE*

Experimental pole culture and culture trials using nylon bags were attempted for green mussel *Perna viridis* at Muttukadu Mariculture Farm of CMFRI (Lat. 12°48′ N; Long. 80°15′ E), located near Madras.

Pole culture experiment

Seventy five teak wood poles, each measuring 3.5 m in height were used for the experiment. Each pole was driven to a depth of 0.5 m in the mud, leaving 3.0 m height above substratum. They were arranged at the northern end of the farm, where the depth ranged from 1.5 to 2.0 m, depending on the tides. On an average, 4.02 kg of seed of *P. viridis*, ranging in length from 15.0 to 53.0 mm (26.6 mm in mean length and 2.05 g in mean weight), were collected from Ennore and were packed in 2 m long cotton bags (Fig. 1). A single bag was tied around each pole, and care was taken to keep the bag well below the low water mark. With the disintegration of the cotton bags in a fortnight's time, the seed gained attachment to poles by byssus threads (Fig. 2).

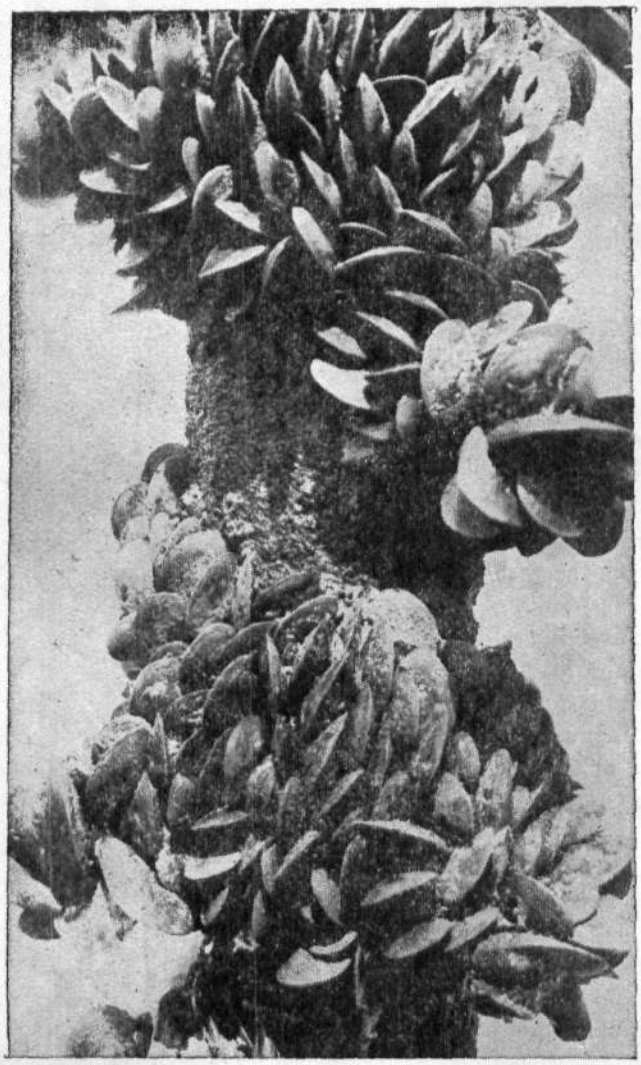


Fig. 1. Mussel attached to poles.

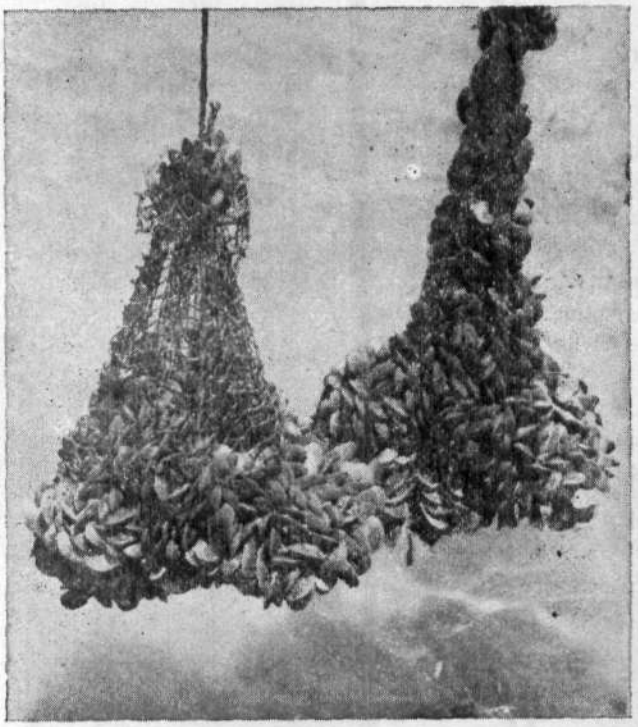


Fig. 2. Growth of mussel in bags.

Bag culture trials

In another experiment, 39 bags, each of 35 x 40 cm size, made of nylon webbings (15 mm mesh size), were seeded with an average of 3.2 kg of seed. They were suspended from a fixed woodencraft (5 x 5 m size), by nylon ropes of 1 m length. The water depth in the area was 1.5 to 2.0 m. The mussel stock was found to grow well, attaching themselves to one another (Fig. 3).

Seeding operations in both cases were done in August, 1986 and the harvest was carried out in

*Prepared by P. V. Sreenivasan, R. Thangavelu and P. Poovannan, Madras Research Centre of CMFRI, Madras.

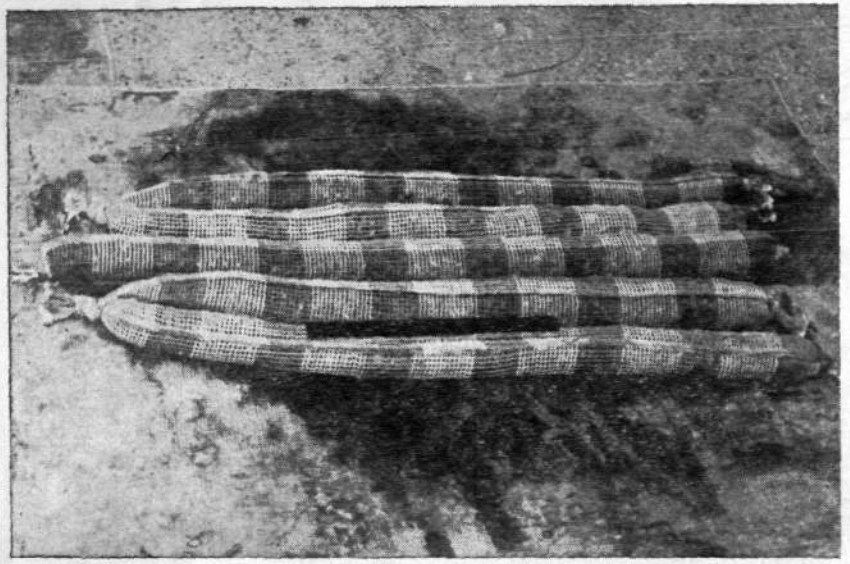


Fig. 3. Mussel seed packed in cotton bags (4.02 kg in 2 m length bag).

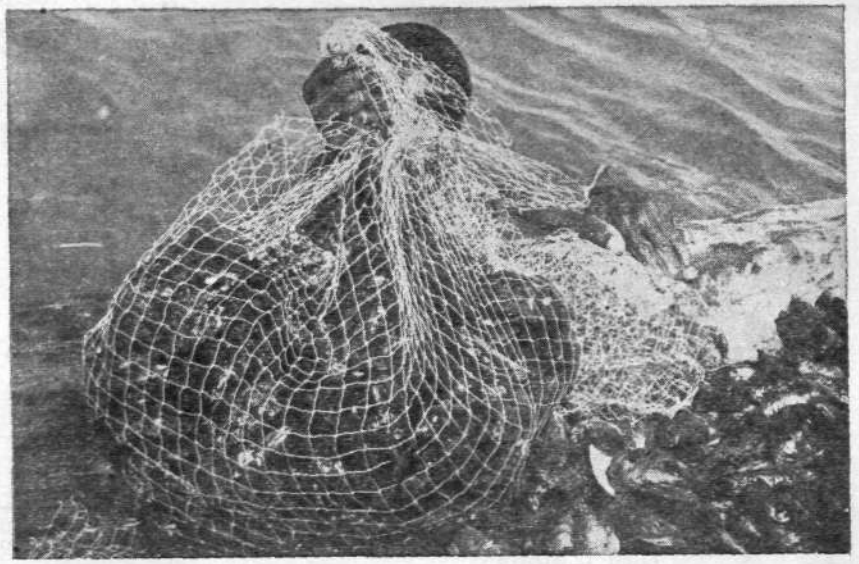


Fig. 4. Loading of mussel into the canoe.

Fig. 5. Unloading of mussel from the canoe.

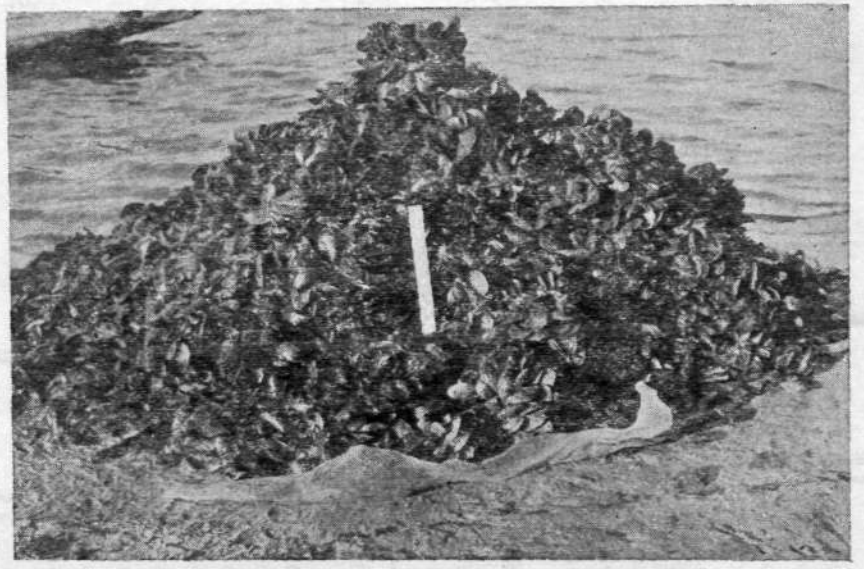


Fig. 6. Harvested mussel from poles (about 1 tonne).

February. During this period, the salinity in the culture site ranged from 17.59‰ (in November) to 40.51‰ (in September) and was around 30‰ in most of the months. Surface temperature varied from 23.8 to 33.8 °C, while dissolved oxygen ranged from 2.98 to 6.66 ml/l. Details regarding the quantity of mussel harvested, net increase in weight and average quantity obtained/unit are given in Table 1 and the process of harvest is shown in Figs. 4 to 6.

Table 1. *Details regarding seeding and harvesting of the green mussel* Perna viridis, *at Muttukadu backwaters*

Particulars	Poles	Bags
Total units seeded	75	39
Seed used (kg)	4.02 /pole	3.2 /bag
Total quantity of seed used (kg)	301.5	121.9
Total units harvested	69	33
Total quantity harvested (kg)	963.9	595.0
Net increase (kg)	662.4	473.1
Average quantity of mussel/unit (kg)	13.96	18.05
Net increase/Unit (kg)	9.94	14.83
Maximum quantity harvested from a single unit (kg)	42.50	43.00

Growth of *P. viridis*, in length and weight, in the six months period is depicted in Figs. 7 and 8. There was an increase of 51.4 and 47.9 mm in length among mussel from poles and bags respectively, from a common mean seed size of 26.6 mm. Correspondingly, the increase in weight was from 2.05 to 40.55 g in the case of poles and to 34.47 g in bags.

Growth of *P. viridis*, was observed to be 45 mm in 5 months at Kakinada (Narasimham, 1980. *Bull. Cent. Mar. Fish. Res. Inst.*, **29**: 10–17) and 54 to 65 mm in 6 months at Calicut (Kuriakose, 1980. *Bull. Cent. Mar. Fish. Res. Inst.*, **29**: 33-38), when the mussel was grown on ropes in the sea. Earlier at Madras, an average growth of 12.8 to 13.0 mm per month was recorded for the same species in the rope culture at Kovalam Bay (Rangarajan and Narasimham, 1980. *Bull. Cent. Mar. Fish. Res. Inst.*, **29**: 39-41). Though grown in saltwater lagoon like Muttukadu backwaters,

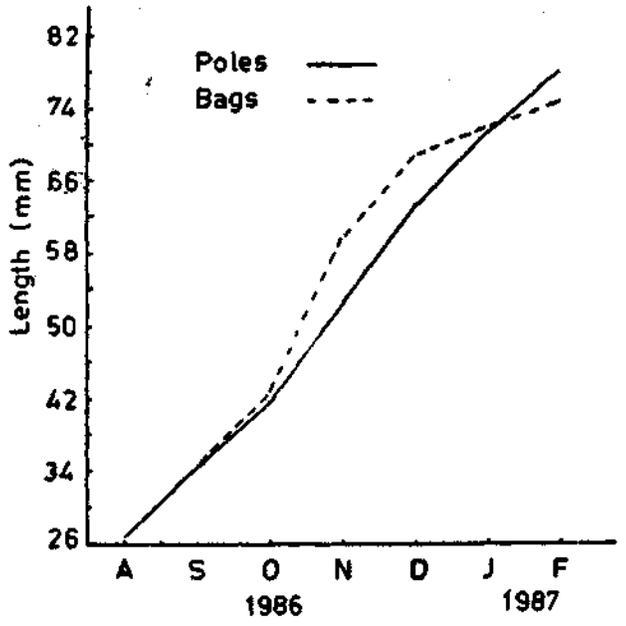


Fig. 7. Growth in length of *P. viridis* on poles and in bags (monthly mean values are given).

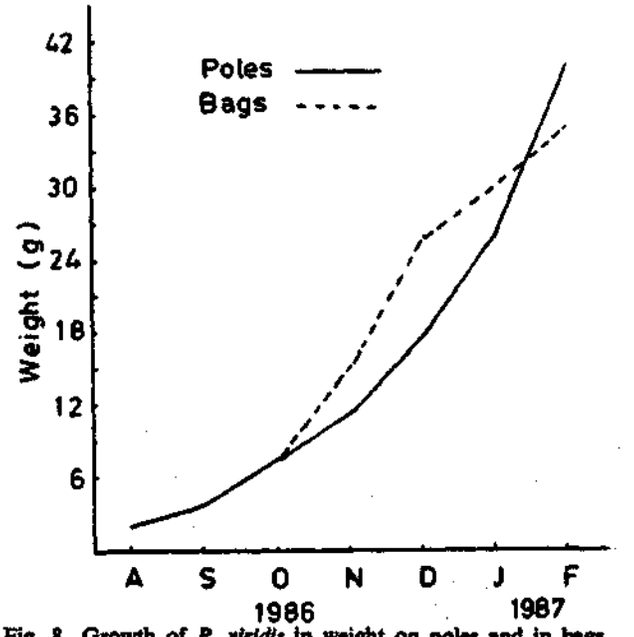


Fig. 8. Growth of *P. viridis* in weight on poles and in bags (monthly mean values are given).

growth of *P. viridis* was found to be comparable with that of the mussel at Kakinada and Calicut.

The present experiments are first of its kind indicating the feasibility of culturing the green mussel in saltwater lagoon, by adapting pole and bag culture methods. The mariculture farm at Muttukadu appears to be suitable for green mussel culture.

OBSERVATIONS ON THE FISHERY OF BANANA PRAWN ALONG THE NORTH KANARA COAST WITH NOTES ON ITS SCHOOLING BEHAVIOUR AND MIGRATION*

Introduction

Penaeus (Fenneropenaeus) merguiensis commonly known as banana prawn is one of the commercially important penaeid prawns occurring in Indian waters. This species inhabits the coastal waters upto a depth of about 55 metres. It is relatively more abundant in the shallower areas where the sea bottom is muddy and sandy. *P. merguiensis* occurs throughout the Indo-Pacific in tropical and sub-tropical waters supporting commercial fisheries along the coasts of Malaysia, Thailand, Indonesia, Australia, India and Pakistan. On the west coast of India this species is caught in appreciable quantities from North Kanara, Goa and Ratnagiri coasts. It forms 1.4% of the total prawn landings by shrimp trawlers at Karwar. A seasonal fishery for this species from June to August has been reported from Goa. Fishermen of North Kanara coast operate indigenous gears such as gill nets and shore seines in coastal waters throughout the year at different depths, depending on weather conditions. During 1981, the author noticed occurrence of banana prawns in good quantities in the bottom-set gill nets operated in the inshore waters off Sankrubag landing centre. As this species is a large sized one and in great demand by the fishing industry, a detailed observation of this fishery was undertaken during 1981–'84 along the North Kanara coast and the results are presented in this communication.

Fishery

The bottom-set gill nets are employed for catching prawns along this coast during the monsoon period June to August as in other regions of the west coast. The nets are operated from dug-out canoes (6.0–10.3 m in length), each manned by two persons and the period of each fishing trip extends from about 0530 to 1430 hrs. Usually the prawn grounds covered by this fishery extend upto about 2 km from the shore where depth ranges from 6 to 9 m.

The fishery season generally commences with the onset of monsoon and extends for about three months in June, July and August. Peak of the fishery varies from year to year within this period.

Catch and effort: The centre-wise data on total catch, effort and CPUE for the different centres of observation are given in Table 1. At Chendia, *P. merguiensis* occured in the gill net catches during 1981, '82 and '84. The average daily catch per unit effort (CPUE) was worked out to 1.72 kg for these three years. The maximum catch and CPUE were observed during 1984 and 1982 respectively (Table 1). Continuous observations were made at Sankrubag throughout 1981–'84 and the maximum catch and CPUE were recorded during June–July 1982. The average CPUE was 2.85 kg for this centre. Gill nets were not operated at Karwar during 1981 season due to scarcity of prawns but the fishery existed during 1982–'84. Maximum catch of the banana prawn was noticed during July–August, '82, but the CPUE was at its peak during 1983. The average CPUE for the period 1982–'84 was 5.55 kg. Majali recorded the lowest catch and CPUE, the average CPUE for 1983–'84 period being 0.17 kg. The fishery at Ambekodar could be observed during 1984 only. The maximum catch (12,776 kg) with CPUE of 11.83 kg was observed during July at this centre. Taking into consideration the entire fishery of this coast, maximum landing of *P. merguiensis* was recorded at Ambekodar

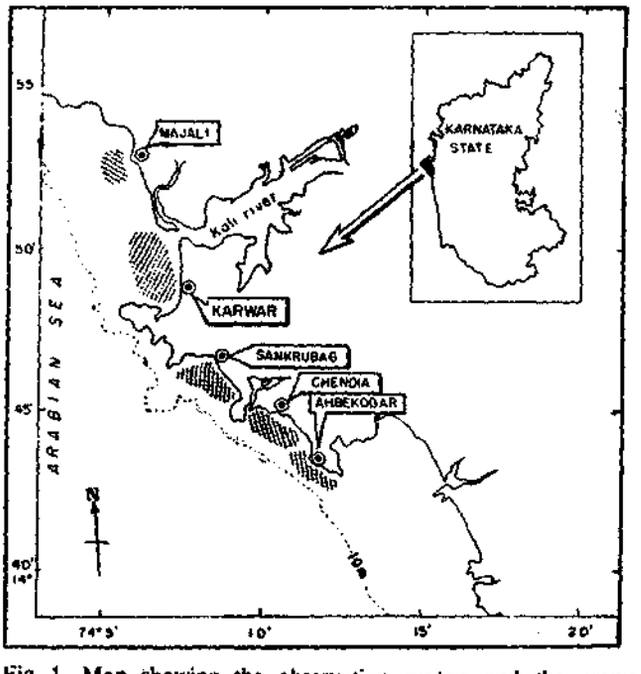


Fig. 1. Map showing the observation centres and the prawn fishing grounds (shaded).

*Prepared by G. Nandakumar, CMFRI, Cochin.

Table 1. *Centrewise details of catch, effort and CPUE of* Penaeus merguiensis *in the gill net fishery from* 1981 *to* '84.

	Season	Estimated No. of units operated	Catch (kg)	CPUE (kg)
1981 Chendia	Jul.	225	326	1.45
Sankrubag	Jun.–Jul.	287	580	2.02
1982 Chendia	Jun.–Jul.	50	1,250	25.00
Sankrubag	Jun.–Jul.	80	2,800	35.00
Karwar	Jul.–Aug.	1,128	6,387	5.66
1983 Sankrubag	Aug.	550	2,339	4.25
Karwar	Jul.–Aug.	374	2,930	7.83
Majali	Jul.–Aug.	2,250	390	0.17
1984 Ambekodar	Jul.	1,080	12,776	11.83
Chendia	Jul.–Aug.	1,430	1,363	0.93
Sankrubag	Jul.–Aug.	1,263	485	0.38
Karwar	Jul.–Aug.	440	1,451	3.30
Majali	Jul.–Aug.	534	94	0.18

during 1984 while the best CPUE was observed at Sankrubag during June–July, '82. The data also indicated that the prawn production was not consistent at any particular centre (Table 1).

Structure of population: Centrewise details on size range and dominant modal values of males and females of *P. merguiensis* are shown in Fig. 2. The total length of this species varied between 111 and 165 mm for males and 106 and 215 mm for females. The size frequency was generally unimodal or bimodal in nature. The bulk of the fishery was supported by the size groups between 130 and 170 mm. Studies on sex ratio in the prawn catches showed the preponderance of females over males in all the centres during 1981–'84 with an exception at Chendia during 1981–'82 when males outnumbered the females. Most of the females observed in the catches did not have mature ovaries.

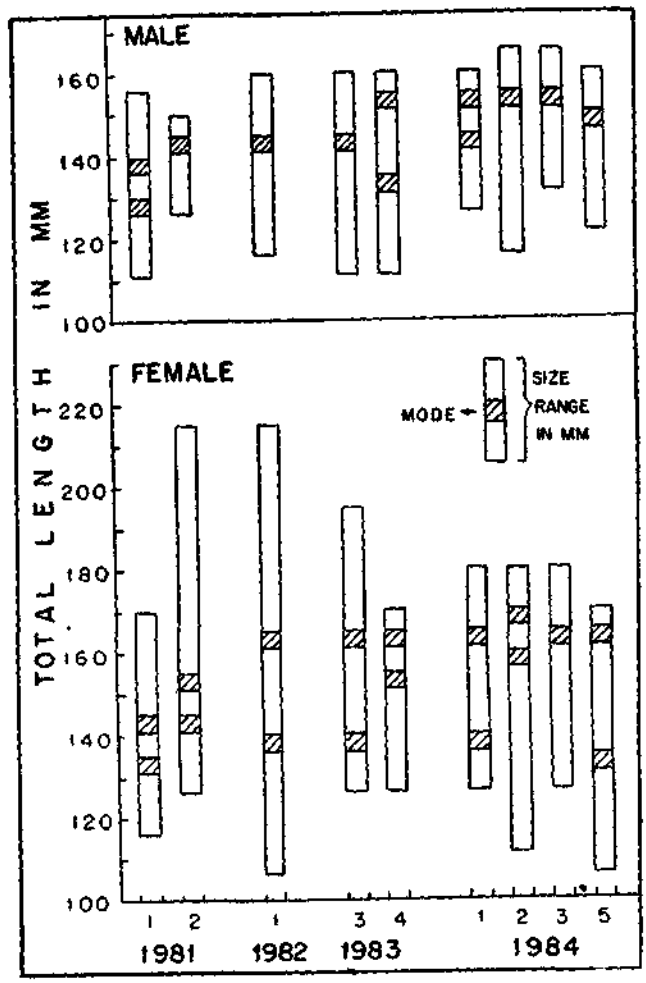


Fig. 2. Size distribution of *Penaeus merguiensis* in the gill net fishery along the North Kanara coast.

1 - Chendia, 2 - Sankrubag, 3 - Karwar, 4 - Majali, 5 - Ambekodar.

Discussion

The present study on the seasonal fishery of *P. merguiensis* along the inshore waters of Karnataka coast during the monsoon period (June–August) reveals some kind of sporadicity of occurrence and schooling behaviour of the banana prawn. It has been established by large-scale tagging experiments that this species is capable of undertaking long range migrations moving even upto 150 km off-shore.

In order to ascertain the possible migratory pattern of *P. merguiensis* along the North Kanara coast an attempt was made to closely follow the spurt in the landings at the different centres between Ambekodar and Majali (Fig. 1) during the season of 1984. It was observed that *P. merguiensis* fishery started around Ambekodar, Chendia and Sankrubag during the first week of July, '84 and the maximum catch was recorded at Ambekodar between 6th and 10th July (12 kg of prawn per unit per day). The prawn catch at Chendia and Sankrubag during the same period was 1–2 kg per unit per day except on one occasion when one boat landed a record catch of 100 kg of banana prawns on

10-7-1984. During the third week of July, a few numbers of prawns alone were caught by gill nets in these centres. The fishery was totally absent at Karwar and Majali until 26-7-1984. Suddenly *P. merguiensis* started appearing in Karwar Bay from 27-7-1984 and the peak fishery was observed between 10th and 15th August, 1984. The fishery was absent at Majali during this period. From the above pattern of occurrence of the fishery at different centres it would appear that *P. merguiensis* might have migrated in shoals from south to north along the coast.

Juveniles of *P. merguiensis* show migrations from backwaters to the coastal waters in Karwar region during January–May. It is possible that juveniles migrating from the backwaters during this period remain in the coastal waters until they attain the adolescent stage and then move out to deeper waters.

Shoaling behaviour and migration of the related species *P. indicus* have been reported earlier, along the southwest and southeast coasts based on the studies on commercial catches . Mark recovery experiments (tagging) have now almost established distant migration of the species along these coasts. Although there is no evidence as to the migratory habits of the banana prawn from the Indian waters, the present observations suggest the possibility of shoaling behaviour and migration of the species along the Karnataka coast. Large scale tagging experiments are necessary to establish this.

ON THE OCCURRENCE OF *MESOPODOPSIS ORIENTALIS* TATTERSALL, A MYSID OFF MAHARASHTRA COAST, WITH A NOTE ON ITS FISHERY*

Mysids or 'Oppossum shrimps' as they are popularly called have not been reported to have any fishery value in Maharashtra State. But at Satpati, an important fishing village of Maharashtra a fishery for a species *(Mesopodopsis orientalis)* was noticed to be in existence. It is locally known as 'Kolim' and the net used for its capture as 'Kolim bokshi' The details of the catch during different years are presented below:

Year	Month	Unit	Gear	Catch (kg)	C.P.U. (kg)
1984	Apr.–May	1,360	Kolim bokshi	14,000	10.3
1985	,, ,,	1,450	,,	14,500	10.0
1986	,, ,,	1,500	,,	15,005	10.1

Craft and gear : Dugout canoes locally called *Tony* are engaged for fishing with a crew of two fishermen. The gear used is a stationary bag net locally known as 'Kolim bokshi' operated in the creek at Satpati in about 3–5 m depth. The length of the net is approximately 6–7 m and the mouth is about 2.5 to 3 m. The net is made out of fine meshed nylon cloth with a mesh size of 0.1 mm. The entire cost of the net ranges from Rs. 250–300. The net is tied to the stakes fixed in the creek and is generally operated during the spring tide or *Udhan* period.

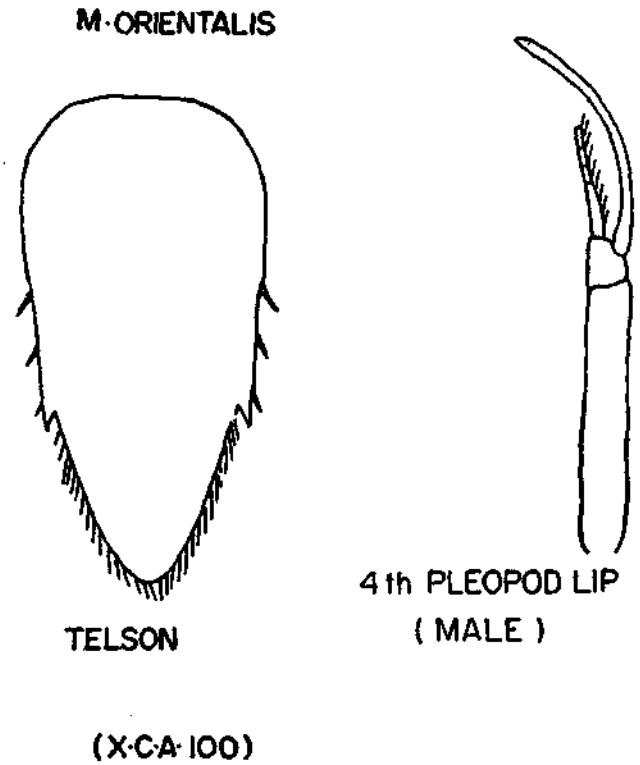


Fig. 1. Chief identification characters of *M. orientalis.*

*Prepared by M. Aravindakshan, J. P. Karbhari, C. J. Josekutty and J. R. Dias, Bombay Research Centre of CMFRI, Bombay.

The mysid *M. orientalis* comprised 90% of the landings. The other items were fish larvae and larvae of decapod crustaceans.

The chief characters that help in the identification of the species *M. orientalis* are the structure and the shape of telson and the fourth pleopod of males. The lateral spines on telson stated to be four for this species (Pillai, 1965, *Proc. Symp. Crustacea*, MBAI, Part V: 1680-1727) was found to vary from 3–5 (Fig. 1). But majority had only four spines on each side of the telson. No change in the number and nature of the spines on the third exopod segment of the fourth pleopod was noticed.

Remarks: The fishery for *M. orientalis* (Fig. 2) is seasonal. It starts from April and closes just after the first rain in June. The reason for closure is the lack of drying facility for the mysids. The catch is salted and sun-dried. It can fetch a price of Rs. 7–8/kg. It is highly relished by the local people. The size range of the specimens is very small varying from 5–7 mm and the sex ratio was observed to be 1:2 with females in domination. *M. orientalis* is abundantly available during April and May and so the fishermen who cannot go onboard the mechanised country craft/trawlers are engaged in this fishery.

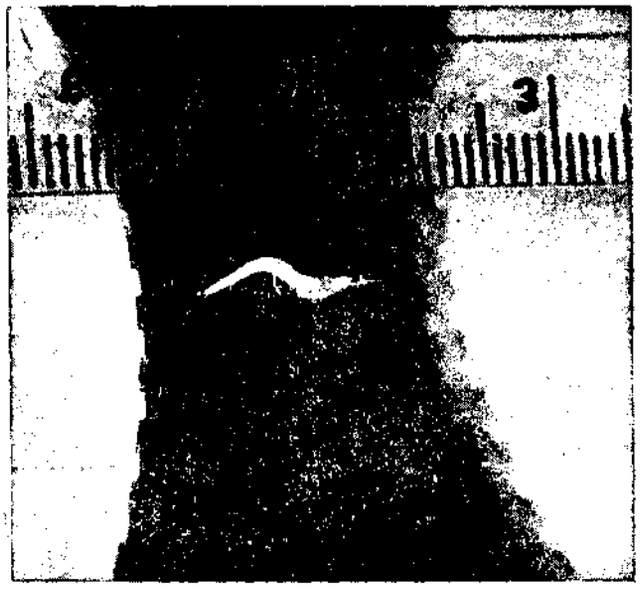


Fig. 2. *Mesopodopsis orientalis*

ON A WHALE SHARK *RHINIODON TYPUS* SMITH LANDED AT PUDUMANAIKUPPAM, MADRAS*

On the 6th March, 1987, a female whale shark measuring 506 cm was landed at 1400 hrs at Pudumanaikuppam landing centre, Madras District, Tamilnadu State. It was reported that the whale shark along with other fishes namely *Scomberomorus* spp. and *Euthynnus affinis* got entangled in a gill net operated by a mechanised boat about 30 km north from the shore at about 70 m depth. The gill net was completely damaged by the whale shark. The boat crew tied nylon rope around the body and brought it to the shore. The whale shark weighed approximately 1,250 kg. As there was no buyer, the whale shark was towed to the sea and discarded.

*Reported by S. Subramani, Madras Research Centre of CMFRI, Madras.

The following measurements (in cm) have been recorded:

1.	Total length	: 506
2.	Standard length	: 389
3.	Width of mouth from angle to angle	: 74
4.	Snout to first dorsal	: 217
5.	Snout to second dorsal	: 301
6.	Snout to first gill	: 82
7.	Length of caudal fin	: 117
8.	Snout to pectoral	: 99
9.	Vertical height of first dorsal fin	: 44
10.	Vertical height of second dorsal fin	: 19

ON THE CAPTURE OF A GIANT SIZED 'INDIAN THREADFIN' *POLYNEMUS INDICUS* SHAW AT SATPATI, MAHARASHTRA COAST*

A female specimen of *Polynemus indicus* Shaw locally called 'dara' measuring 170 cm in total length and weighing 50.08 kg was landed at Satpati (about 80 km north of Bombay) on 29th January, 1987. It was caught along with other fishes by a 22-footer mechanised 'bagnetter' in 28 m depth off Murba-Satpati coast. The fish was auctioned locally for a record price of Rs. 855/-.

Day (*Fauna of British India - Fishes*, **2**, *London*, 1889) had recorded a maximum length of 126.6 cm for *Polynemus indicus* with the weight of 9 kg. Mohamed (*Indian J. Fish.*, **2**: 164-179, 1955) had observed 142.3 cm in length with the weight of about 27 kg for this species. According to Fisher & Bianchi (*FAO Species Identification Sheets, Western Indian Ocean, Area* 51 *Vol.* **3**, 1984) the fish attains a maximum length of 142 cm. The present record of the fish is the highest both in length and weight from Indian waters. The important morphometric characters of the present fish (in cm) are presented below.

1.	Total length	...	170
2.	Standard length	...	134
3.	Head length	...	39.4
4.	Girth of body	...	95.4
	Vertical height of		
5.	First dorsal fin	...	26.2
6.	Second dorsal fin	...	27.9
7.	Anal fin	...	20.2
8.	Length of caudal fin from caudal pit along the upper margin	...	37.3
9.	Length of the upper filamentous ray of pectoral fin	...	50.1
10.	Diameter of eye	...	1.6
11.	Distance between eye and nostril	...	3.8
12.	Distance between eye and snout	...	9.5
13.	Length of swim bladder	...	48.5
14.	Weight of swim bladder (g)	...	80
15.	Weight of ovary (kg)	...	1.5

*Reported by J. P. Karbhari, J. R. Dias and M. Aravindakshan, Bombay Research Centre of CMFRI, Bombay.

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