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SYNOPSIS OF MARINE PRAWN FISHERY OF INDIA-1981*

Total production

The total marine prawn production during the year 1981 was estimated at 1,44,969 tonnes against 1,70,737 tonnes in 1980 (Table 1), showing a decrease of 25, 768 t (15.1%). A glance at the marine prawn production of the country over the past few years indicates that the trend of decrease from the maximum in 1975 is maintained over these years and this year the comparative reduction is considerably high and this is mostly brought about by reduced catches in Kerala State, especially in a single centre, ie. Neendakara and that too of a single species of penaeid prawn.

Taking into account the production of the penaeid prawns and nonpenaeid prawns separately the decrease in landings in 1981 is noticed only in penaeid prawns, while nonpenaeid prawns showed an increase from that of 1980 (Table 2). During 1981 the penaeid prawn catch recorded a reduction of 28,498 t (25.4%) and the nonpenaeids an increase of 2,730 t (4.7%). The decrease in penaeid prawn catch is mostly due to the steep decline in a single species catch occurring in Kerala State, the catch declining from 52,633 t in 1980 to 22,268 t in 1981.

Compared to last year, when the maximum production was in the month of July, the maximum productive months in 1981 were April and May, in which months maximum quantities of prawns were landed in Maharashtra (Table 3). The failure of the monsoon fishery of Neendakara in Kerala state this year is the main reason for July going out of

the picture, as the maximum productive months for prawns September, June and August were the months in which minimum quantities of prawns were landed. In Kerala State, of course the maximum productive month is July, but the decline in the total quantity of prawns landed in that month at Neendakara to less than one third of the catch of last year has made the month less conspicuous in production at all India level. However for taking the penaeid prawns alone July is the month of maximum production and September and June least productive. For nonpenaeid prawns April-May is the period of maximum production, the major portion coming from the state of Maharashtra. June to September is the least productive months for nonpenaeid prawns.

As usual the statewide production this year also shows the maximum in Maharashtra, being 51.4% showing 10% more than last year. On the contrary the percentage contribution of Kerala state registered nearly 16% decrease, giving only 15.5% of the total production (Table 1) against 31.8% of last year. The statewide and monthwise landings of penaeid and nonpenaeid prawns (Table 4 and 5) indicate that penaeid prawns contribute to the major portion of the fishery in Kerala, Tamil Nadu, Pondicherry and Orissa. Almost the entire fishery of Goa, Andamans and Karnataka is contributed by penaeid prawns. In Gujarat about two thirds of the fishery is contributed by penaeids while in Andhra Pradesh penaeid prawns formed

* Prepared by Crustacean Fisheries Resources team. Compilation: M.J.George, C.Suseelan M.M.Thomas V.S.Kakati, and C.Nalini.

Table 1. Statewise prawn landings and percentage contributions during 1981 and 1980

Maritime States	Prawn landings in tonnes		Percentage	
	1981	1980	1981	1980
Gujarat	15,727	18,590	10.8	10.8
Maharashtra	74,571	70,742	51.4	41.4
Goa	2,237	1,853	1.6	1.0
Karnataka	4,126	3,226	2.9	1.8
Kerala	22,428	54,375	15.5	31.8
Tamil Nadu	14,252	10,028	9.8	5.8
Pondicherry	389	527	0.3	0.3
Andhra Pradesh	8,335	10,006	5.8	5.8
Orissa	1,383	1,104	0.9	0.6
West Bengal	1,495	200	1.0	0.1
Andamans	26	54	-	-
Larger trawlers	*	32	-	-
All India Total	1,44,969	1,70,737	100	100

*144 tonnes included with the catch of Andhra Pradesh

Table 6. Species wise break up of prawn landings and percentages during 1981

Species	All India landings percentage in tonnes	
<i>Solenocera crassicornis</i>	8,084	5.6
<i>Penaeus indicus</i>	7,537	5.2
<i>P.merguiensis</i>	1,096	0.8
<i>P.monodon</i>	941	0.6
<i>P.semisulcatus</i>	7,898	5.4
<i>Metapenaeopsis stridulans</i>	506	0.3
<i>Metapenaeus dobsoni</i>	10,059	6.9
<i>M.affinis</i>	5,025	3.5
<i>M.monoceros</i>	7,073	4.9
<i>M.brevicornis</i>	907	0.6
<i>M.kutchensis</i>	857	0.6
<i>Parapenaeopsis stylifera</i>	29,109	20.1
<i>P.hardwickii</i>	2,123	1.5
<i>Acetes indicus</i>	38,430	26.5
<i>Nematopalaemon tenuipes</i>	19,698	13.6
<i>Exopalaemon styliferus</i>	859	0.6
<i>Exhippolysmata ensirostris</i>	2,309	1.6
Other species	2,458	1.7
Total	1,44,969	100.0

Table 2. Statewise penaeid and non-penaeid prawn landings and their percentage for 1981 and 1980

Maritime States	Landings in tonnes and percentage							
	1981				1980			
	Penaeid		Non-penaeid		Penaeid		Non-penaeid	
Catch	%	Catch	%	Catch	%	Catch	%	
Gujarat	10,985	13.1	4,742	7.8	14,481	12.9	4,109	7.0
Maharashtra	21,717	26.0	52,854	86.0	23,433	20.9	47,309	80.5
Goa	2,237	2.7	-	-	1,853	1.6	-	-
Karnataka	4,122	4.9	4	-	3,098	2.7	128	0.2
Kerala	22,268	26.7	160	0.3	52,633	46.9	1,742	2.9
Tamil Nadu	13,548	16.2	704	1.1	9,082	8.1	946	1.6
Pondicherry	336	0.4	53	0.1	485	0.4	42	-
Andhra Pradesh	6,728	8.1	1,607	2.6	5,660	5.0	4,346	7.4
Orissa	1,328	1.6	55	0.1	1,074	0.9	30	-
West Bengal	244	0.3	1,251	2.0	152	0.1	48	-
Andamans	26	-	-	-	54	-	-	-
Larger trawlers	*	-	-	-	32	-	-	-
All India total	83,539	100	61,430	100	1,12,037	100	58,700	100

* 144 tonnes included with the catch of Andhra Pradesh.

Table 3. Monthly prawn landings in different maritime states during 1981

Maritime states	Prawn catch in tonnes												Larger trawlers	Total for 1981
	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Gujarat	1,635	428	1,394	1,183	1,063	37	47	210	580	3,841	3,530	1,779	-	15,727
Maharashtra	6,805	7,798	7,056	14,254	17,199	1,228	305	931	2,057	6,480	4,761	5,688	-	74,571
Goa	375	157	414	153	283	205	2	210	6	6	4	422	-	2,237
Karnataka	546	462	297	700	524	10	451	61	242	6	194	633	-	4,126
Kerala	1,415	852	1,060	836	1,662	1,765	7,621	4,732	455	395	969	666	-	22,428
Tamil Nadu	917	730	468	1,144	796	1,649	3,773	1,249	538	802	1,123	1,063	-	14,252
Pondicherry	84	25	23	38	37	54	34	17	9	2	9	57	-	389
Andhra Pradesh	713	1,469	219	605	274	250	945	1,178	806	699	622	411	144	8,335
Orissa	122	114	20	64	103	25	29	51	72	213	165	405	-	1,383
West Bengal	772	-	-	2	2	-	6	2	-	1	568	142	-	1,495
Andamans	-	-	5	-	-	4	-	-	7	-	-	10	-	26
All India Total	13,384	12,035	10,956	18,979	21,943	5,227	13,213	8,641	4,772	12,454	11,945	11,276	144	1,44,969
Monthwise percentage	9.2	8.3	7.6	13.1	15.1	3.6	9.1	6.0	3.3	8.6	8.2	7.8	0.1	

Table 4. Penaeid prawn landings in different maritime states during 1981

Maritime States	Prawn catch in tonnes												Larger trawlers	Total for 1981
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Gujarat	1,500	345	403	398	295	19	3	162	486	2,822	3,048	1,504	-	10,985
Maharashtra	2,225	1,481	2,347	3,050	1,644	486	151	514	1,390	2,960	2,814	2,655	-	21,717
Goa	375	157	414	153	283	205	2	210	6	6	4	422	-	2,237
Karnataka	546	462	297	700	524	10	451	61	242	6	190	633	-	4,122
Kerala	1,414	829	1,026	811	1,650	1,755	7,591	4,732	430	395	969	666	-	22,268
Tamil Nadu	908	719	452	1,126	783	1,410	3,531	1,217	519	764	1,071	1,048	-	13,548
Pondicherry	48	17	22	38	37	49	34	17	9	2	9	54	-	336
Andhra Pradesh	652	1,461	205	318	271	214	639	459	772	678	538	377	144	6,728
Orissa	122	114	20	64	103	25	29	49	72	174	151	405	-	1,328
West Bengal	-	-	-	-	-	-	4	2	-	1	212	25	-	244
Andamans	-	-	5	-	-	4	-	-	7	-	-	10	-	26
All India total	7,790	5,585	5,191	6,658	5,590	4,177	12,435	7,423	3,933	7,808	9,006	7,799	144	83,539
Monthwise percentage	9.3	6.7	6.2	7.9	6.7	5.0	14.9	8.9	4.7	9.3	10.9	9.3	0.2	

Table 5. Non-penaeid prawn landings in different maritime states during 1981

Maritime States	Prawn catch in tonnes												Total for 1981
	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	
Gujarat	135	83	991	785	768	18	44	48	94	1,019	482	275	4,742
Maharashtra	4,580	6,317	4,709	11,204	15,555	742	154	417	667	3,529	1,947	3,033	52,854
Goa	-	-	-	-	-	-	-	-	-	-	-	-	-
Karnataka	-	-	-	-	-	-	-	-	-	-	4	-	4
Kerala	1	23	34	25	12	10	30	-	25	-	-	-	160
Tamil Nadu	9	11	16	18	13	239	242	32	19	38	52	15	704
Pondicherry	36	8	1	-	-	5	-	-	-	-	-	3	53
Andhra Pradesh	61	8	14	287	3	36	306	719	34	21	84	34	1,607
Orissa	-	-	-	-	-	-	-	2	-	39	14	-	55
West Bengal	772	-	-	2	2	-	2	-	-	-	356	117	1,251
Andamans	-	-	-	-	-	-	-	-	-	-	-	-	-
All India Total	5,594	6,450	5,765	12,321	16,353	1,050	778	1,218	839	4,646	2,939	3,477	61,430
Monthwise percentage	9.1	10.5	9.4	20.1	26.6	1.7	1.3	1.9	1.4	7.6	4.8	5.6	

Table 7. Annual percentage distribution of important species in the prawn landings at different centres during 1981

Centres	PENAEIDS												
	<i>S. crassicornis</i>	<i>P. indicus</i>	<i>P. merguensis</i>	<i>P. monodon</i>	<i>P. semisulcatus</i>	<i>M. stridulans</i>	<i>M. dobsoni</i>	<i>M. affinis</i>	<i>M. monoceros</i>	<i>M. brevicornis</i>	<i>M. kutchensis</i>	<i>P. styliferus</i>	<i>P. hardwickii</i>
Veraval	13.9	-	-	-	5.8	-	-	7.5	5.8	-	7.8	41.7	12.4
Bombay	28.7	-	-	-	-	-	-	11.9	10.6	2.8	-	39.1	3.5
Karwar	-	0.2	0.8	0.2	-	-	20.7	9.1	39.1	-	-	29.5	-
Malpe	-	3.7	-	0.5	-	-	32.3	3.7	12.6	-	-	47.2	-
Mangalore	-	3.6	-	0.7	-	-	45.5	1.4	6.8	-	-	42.0	-
Calicut	-	5.7	-	-	-	-	56.3	-	1.4	-	-	36.7	-
Cochin	-	10.9	-	0.2	-	-	37.7	1.1	0.3	-	-	49.2	-
Neendakara	-	9.2	-	0.1	0.1	-	3.5	2.1	1.4	-	-	83.1	-
Tuticorin	-	44.2	-	-	55.0	-	0.4	-	-	-	-	-	-
Mandapam	-	2.3	-	-	81.3	-	-	9.3	-	-	-	-	-
Madras	-	26.7	-	8.6	20.2	-	20.7	-	23.8	-	-	-	-
Kakinada	-	12.3	3.7	8.6	-	-	16.0	8.1	14.5	10.7	-	6.3	-
Waltair	11.7	12.4	-	5.3	0.7	18.3	6.8	-	41.9	-	-	-	-
Puri	-	49.7	35.8	2.8	-	-	-	11.7	-	-	-	-	-
NON-PENAEIDS													
	<i>A. indicus</i>			<i>N. tenuipes</i>			<i>E. styliferus</i>			<i>E. ensirostris</i>			
Veraval	46.0			32.8			-			21.2			
Bombay	66.0			32.5			-			1.5			
Kakinada	30.6			21.2			20.4			11.5			

three fourths of the total prawn fishery. In Maharashtra only more than two thirds of the fishery is constituted by nonpenaeid prawns, out of which the maximum quantities were landed in the months of April and May.

In the overall species composition in the prawn landings (Table 6) as in 1979 *Acetes indicus* ranked first (26.5%), relegating *Parapenaeopsis stylifera* (20.1%), which came first in 1980, to the second position. This was mainly due to the poor landings of *P.stylifera* in this year during the monsoon fishery at Neendakara in Kerala State. The other important species in the order of their abundance were *Nematopalaemon tenuipes*, *Metapenaeus dobsoni*, *Solenocera crassicornis*, *Penaeus semisulcatus*, *Penaeus indicus*, *Metapenaeus monoceros* and *M.affinis*, which collectively

accounted for 45.1% of the total production. Noticeable changes evident from previous year's data in the case of the representation of these species are the third position taken by the nonpenaeid prawn *N.tenuipes* relegating *M.dobsoni* to fourth position and increased representation of *S.crassicornis* and *P. semisulcatus* occupying fifth and sixth positions respectively. The dominant species *A.indicus* was mostly harvested from Maharashtra, Gujarat and Andhra Pradesh. The annual percentage distribution of important species at different observation centres during 1981 is given in table 7.

Gearwise production

Shrimp trawls operated by various sizes of boats formed the single major gear employed in the exploitation of prawns as in the previous years.

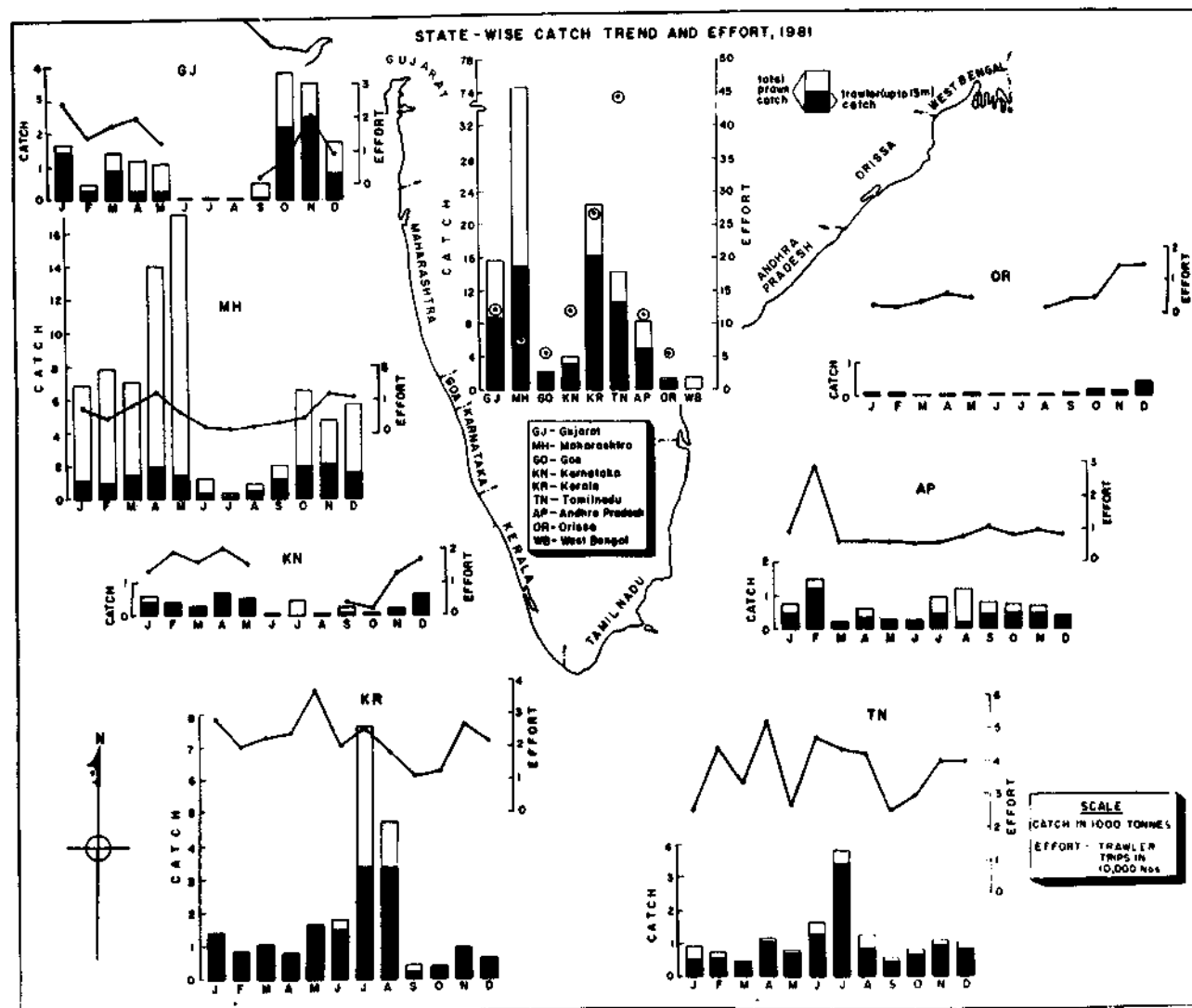


Fig. 1. Prawn landings by commercial shrimp trawlers in relation to the total prawn catch and the fishing effort during 1981.

The overall fishing input by this gear showed improvement to the extent of 6% over that of last year. While the fishing was more active in most of the maritime states this year, it decreased considerably in Maharashtra, Kerala and Orissa.

In spite of the general increase in fishing effort, the production of prawns by trawlers declined to 63,689 t from 87,956 t of the previous year showing a reduction rate of 27.6%. This was mainly due to the lower landings recorded along the coasts of Kerala. While in most of the other states the increase in trawler landings was only marginal, Tamil Nadu and Orissa registered remarkably good catches with an increase to the tune of 82% in the former and 47% in the latter state over the production of the previous year. Out of the total estimated prawn catch of 1,44,969 t from the marine sector the trawler landings accounted for 44% as against 51.5% of last year. The rest of the catch was mainly contributed by fixed bag nets in Gujarat, Maharashtra and West Bengal and seines, gill nets and other indigenous gears in the other states. The statewise percentage contributions of prawn landings by shrimp trawlers for this year as well as the previous year (in parenthesis) were: Kerala-25.6 (52.4), Maharashtra-23.4 (17.1), Tamil Nadu-18.3 (7.3), Gujarat-13.8 (11.7), Andhra Pradesh-8.1 (4.4), Karnataka-5.2 (3.4), Goa-3.2 (2.0), Orissa-1.9 (1.0) and Pondicherry-0.5 (0.4). Penaeid prawns accounted for the bulk of these catches in all the states, forming 92-100%.

The annual as well as seasonal production trends of the commercial trawl fishery of different maritime states in relation to the effort and total prawn landings are depicted in Fig. 1. In the annual prawn landings of individual states trawlers contributed to the major share in Goa (90.5%), Orissa (89.7%), Tamil Nadu (82.0%), Karnataka (78.4%), Pondicherry (76.3%), Kerala (72.7%), Andhra Pradesh (60.5%) and Gujarat (56.0%). In Maharashtra its contribution was only 20% which was slightly less than that of previous year (21.3%).

The peak landings were recorded during February in Andhra Pradesh, April in Karnataka, July in Tamil Nadu, July and August in Kerala, November in Gujarat and Maharashtra and December in Goa, Pondicherry and Orissa.

The striking change noticed in this year in the trawl fishery of the country was that of Kerala where a severe decline in the production of penaeid prawns was observed. This was mainly due to the failure of the monsoon fishery for 'Karikkadi' (*Parapenaeopsis stylifera*) at Sakthiku langara--

Neendakara area. The sudden increase in prawn catch by indigenous gears in this state was brought about by the unusual landings of 'Poovalan chemmeen' (*Metapenaeus dobsoni*) in boat seines during the monsoon months (July & August) at Cannanore and nearby centres.

Veraval (Fig. 2)

Prawn fishing at Veraval and nearby centres was fairly active with an off-season in June-August for trawlers and July-August for 'Dol' nets due to monsoon. The prawn production, however, was much less than that of the previous year. At Veraval, the penaeid prawn landings of shrimp trawlers amounted to only 1,144 t at an annual catch rate of 2.5 kg/hr as against 1,590 t at the rate of 4.4 kg/hr of trawling during 1980. The maximum catch as well as CPUE were recorded during November. As in the previous year, *Parapenaeopsis stylifera* was the dominant species (41.7%) followed by *Solenocera crassicornis* (13.9%), *P. hardwickii* (12.4%), *Metapenaeus kutchensis* (7.8%), *M. affinis* (7.5%) and *M. monoceros* (5.8%) among the regular species. Significant quantities of other penaeid prawns were also landed occasionally, of which *Penaeus penicillatus* and *P. semisulcatus* were important from the point of export industry. The unusually heavy landings of *P. semisulcatus* during October (64.7 t) to the extent of contributing nearly 63% of the penaeid prawn catches of the trawlers was a significant feature noticed in the prawn fishery of this centre during this year. Normally this species is not caught in commercial quantities along this coast. The new occurrence of the species was spread over the shallow as well as deeper areas upto about 80 m depth. Although a wide range of size groups of this species was represented, males of 141-160 mm and female of 141-195 mm, which were sold at Rs. 40-55 per kg, formed the bulk of the catches. Majority of the females were in 'spent' or 'spentrecovering' stages of ovarian maturity and indicated the possibility of completion of their spawning in the offshore waters of this coast. It is interesting to note in this context that in recent years the occurrence of *P. semisulcatus* in the marine and estuarine environments has been steadily increasing along some other areas also.

There was no significant change in the size distribution of the major species of prawns landed at this centre in comparison with that of the previous year. The important size groups that supported the fishery were 73-78 mm for *P. stylifera*, 58-63 mm and 93-123 mm for *P. hardwickii*,

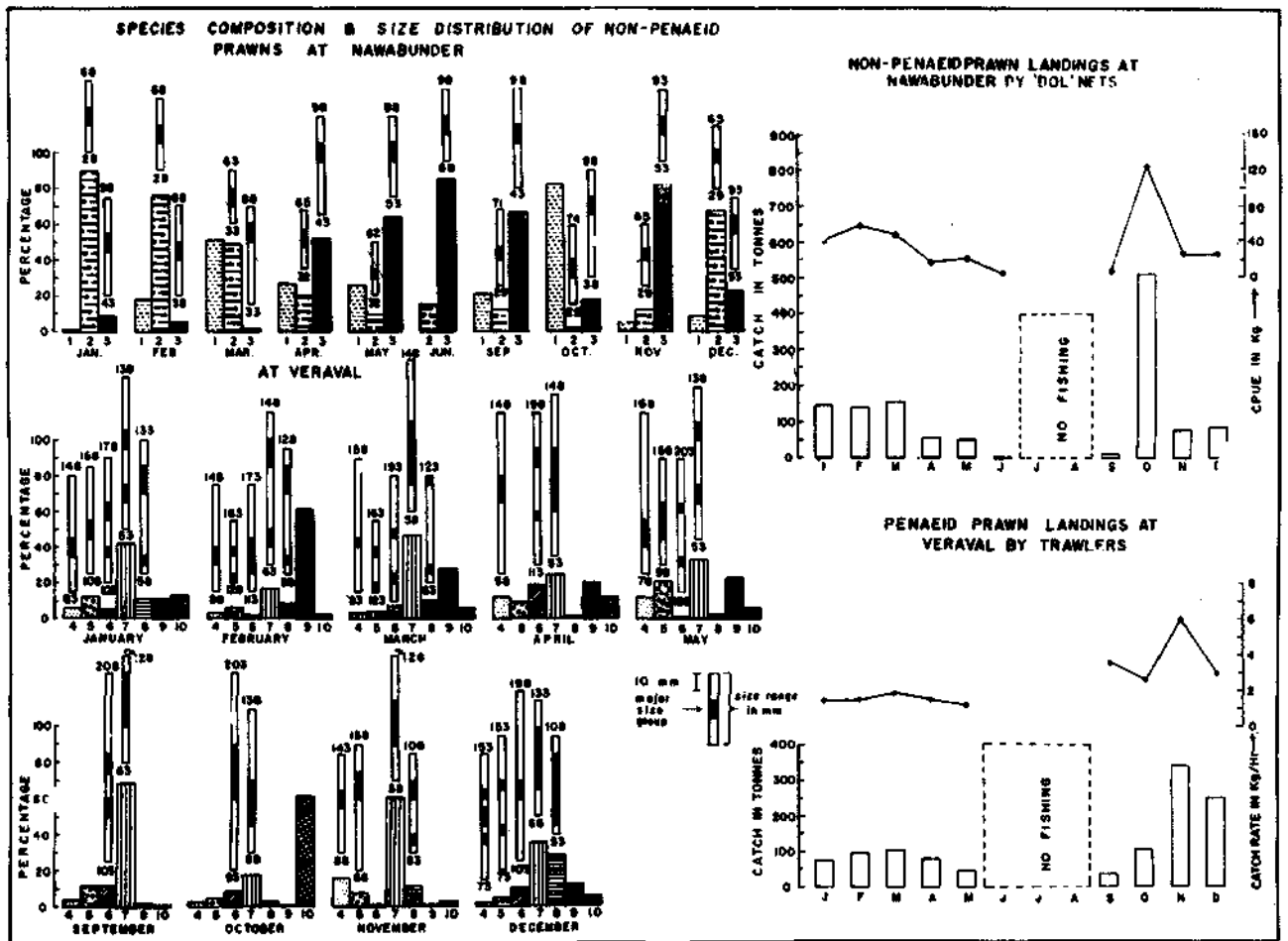


Fig. 2. Catch trend, species composition and size distribution of important species of prawns at Veraval during 1961. 1. *A.indicus*, 2. *N.tenuipes*, 3. *E.ensirostris*, 4. *M.kutchensis*, 5. *M.affinis*, 6. *M.monoceros*, 7. *P.stylifera*, 8. *P.hardwickii*, 9. *S.crassicornis*, 10. Other penaeid prawns.

113-143 mm for *M.affinis* and 123 -163 mm for *M.monoceros*. Peak spawning activities for most of these species were observed during January to May as in the previous year (Fig. 10).

At Nawabunder the non-penaeid prawn landings by 'Dol' nets decreased to 1,227 t from 1,971 t of last year with a corresponding reduction in CPUE from 77.55 kg to 44.85 kg. *Acetes indicus* (46.0%), *Nematopalaemon tenuipes* (32.8%) and *Exhippolysmata ensirostris* (21.2%) constituted the fishery. Peak landing was recorded in October.

Bombay (Fig. 3)

At New Ferry Wharf an estimated catch of 6,011 t of penaeid prawns was landed by trawlers which was 420 t less than in the previous year. The catch rate worked out to 313.2 kg/unit as against 319.5 kg of last year. Peak landings were recorded during March-April and September--November, with meagre fishing activities during the monsoon period June-August. The comparati-

vely lesser production of prawns this year was mainly due to the reduced landings during the postmonsoon season. The premonsoon fishery, however, was relatively of higher magnitude. As usual, *P.stylifera* dominated in the fishery contributing to 39.1% of the annual landings, which was followed by *S.crassicornis* (28.7%), *M.affinis* (11.9%), *M.monoceros* (10.6%) and others. The catch of *S.crassicornis* was exceptionally high during February to April and so also was *P.stylifera* during October and November. Peak landing for *M.affinis* was recorded during September-October. The principal size groups of the important species were 71-125 mm for *P.stylifera*, 56-105 mm for *S.crassicornis* and 116-145 mm for *M.affinis*. Percentage of mature females in the catch was very low, being 1.7-9.5 only for *P.stylifera* and 1.0-6.1 for *M.affinis*. Peak breeding period was April-May for the former species and November for the latter (Fig. 10).

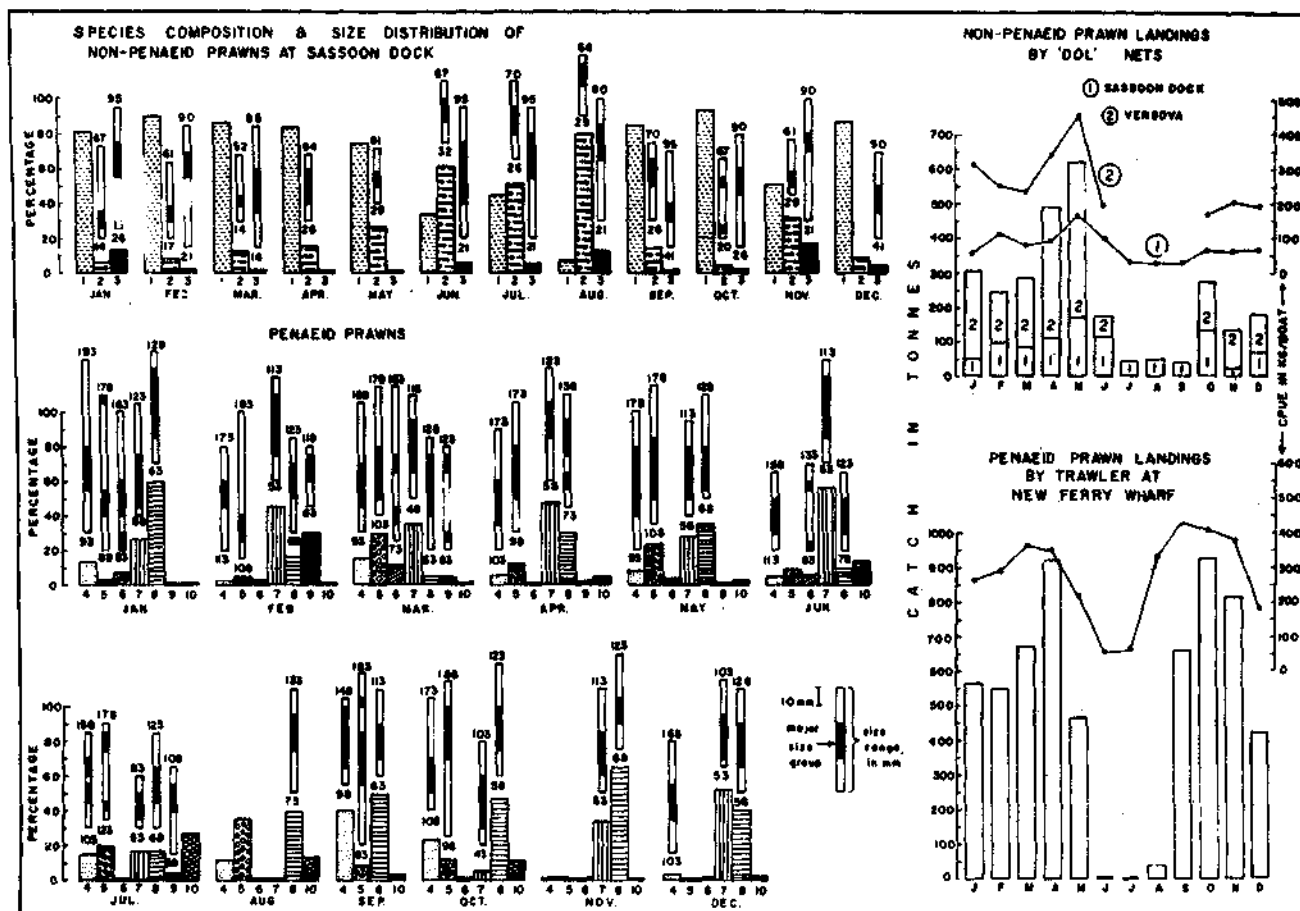


Fig. 3. Catch trend, species composition and size distribution of important species of prawns at Bombay during 1981. 1. *A.indicus*, 2. *N.tenuipes*, 3. *E.ensirostris*, 4. *M.affinis*, 5. *M.monoceros*, 6. *M.brevicornis*, 7. *P.stylifera*, 8. *P.hardwickii* 9. *S.crassicornis*, 10. Other penaeids.

The non-penaeid prawn catch by 'Dol' nets registered a severe decline during this year in continuation of the previous year. The estimated annual catch for the two observation centres viz. Sassoon Dock and Versova was only 2,862 t as against 4,645 t of 1980 and 5,894 t of 1979. The CPUE worked out to 71.1 kg as compared to 69.3 kg at the former centre, thereby showing marginal improvement. *Acetes indicus* contributed 72% at Sassoon Dock and 66% at Versova, followed by *Nematopalaemon tenuipes* and *Exhippolysmata ensirostris* in the order of their abundance. Maximum percentage of berried females of the caridean prawns was recorded during the second half of the years.

Karwar (Fig. 4)

The fishery was sustained mainly by trawlers at Karwar, contributing nearly 97.1 percent of the total prawn catch. An estimated landing of 584.7 t of prawns was recorded during the year 1981, which showed an increase of about 4% over the

previous year when it was recorded at 562.4 t. The peak landing was during April amounting to 179.1 t when the catch per hour registered around 7.4 kg.

M.monoceros, in sizes ranging between 51-135 mm in males and 51-180 mm in females, was dominating the catch by 39.1% unlike the status of the fishery for the previous year, when *P.stylifera* was dominating the catch. In the present year, *M.monoceros* was followed by *P.stylifera*, *M.dobsoni* and *M.affinis* representing 29.5, 20.7 and 9.1 percentage respectively. Though the prawn catch has increased during 1981, the catch per hour was very low at 5.7 kg compared to that of 1980 when it was 18.2 kg.

The shore seine, 'Yendi' accounted for a total catch of 21.3 t as against 5.8 t of the previous year, of which *P.stylifera* alone constituted nearly 52.4 per cent, followed by *M.dobsoni*, *P.merguensis* and *M.affinis*. There was no landing of *P.indicus* as in the previous year when it accounted for

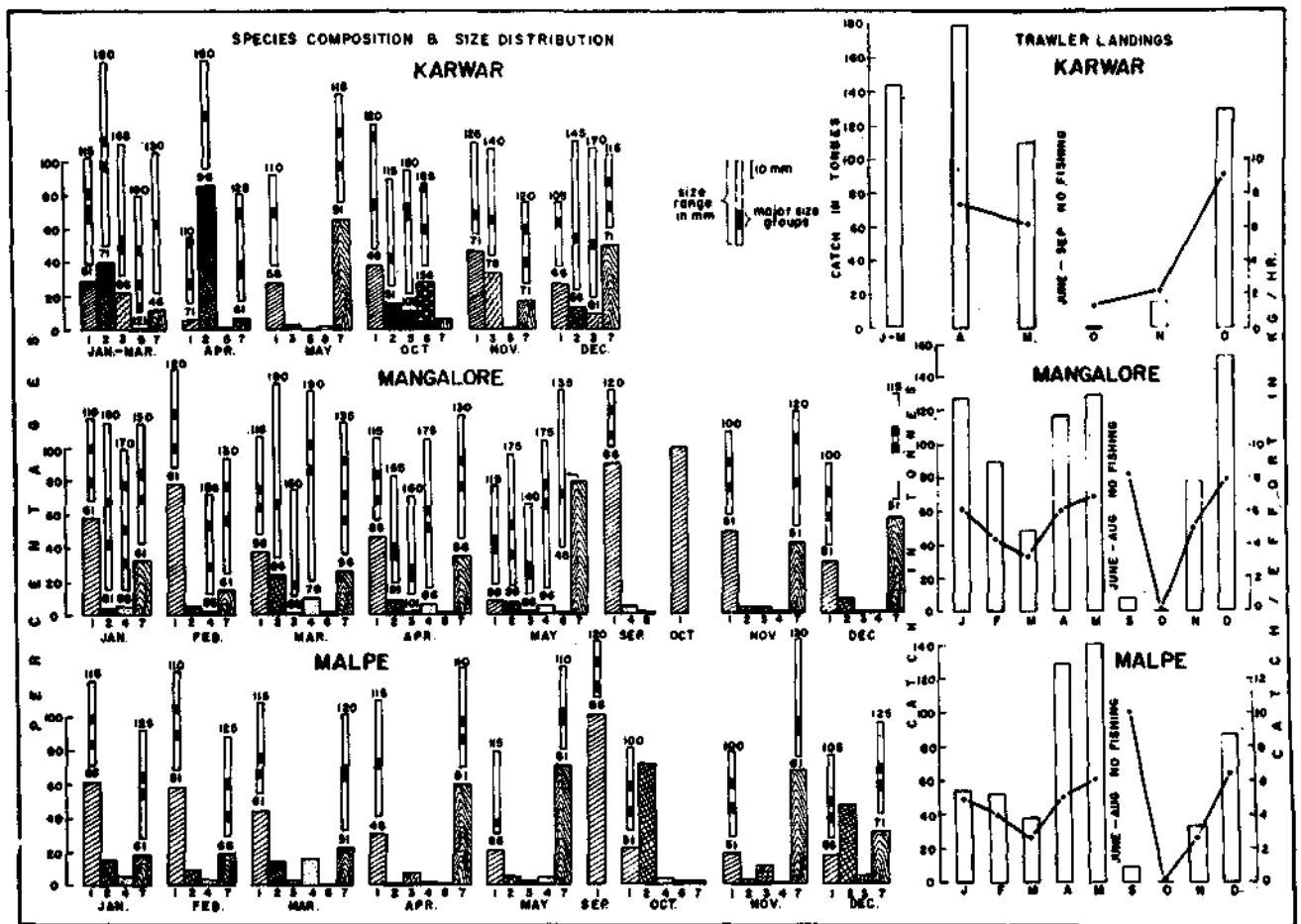


Fig. 4. Catch trend, species composition and size distribution of important species of prawns at Karwar, Malpe and Mangalore during 1981.
 1. *M.dobsoni*, 2. *M.monoceros*, 3. *M.affinis*, 4. *P.indicus*, 5. *P.merguensis*, 6. *P.monodon*, 7. *P.stylifera*, 8. *M.mayebi*.

the major share of 44.0 percent.

The matured females of *M.monoceros* were better represented in the months of February and December thereby indicating the spawning peaks (Fig 10)

Malpe (Fig. 4)

The total estimated landing of prawns by trawlers at Malpe was to the tune of 548.9 t. April and May months recorded the maximum catch of 270.0 t which accounted for 49.2 percent. Though the landing in September was very poor, the maximum catch rate was recorded during that month. The overall catch rate per hour for the year was 4.65 kg. *P.stylifera* was the dominant species accounting for 47.2 percent of the total catch, the size range of the species being from 51-130 mm for both sexes, with recurring modes between 81 and 91 mm. The second species in order of abundance was *M.dobsoni* constituting 32.33 per cent,

followed by *M.monoceros* of 12.56 per cent, *M.affinis* and *P.indicus* representing 3.72 per cent each in the total prawn landings. *M.dobsoni* was ranging between 46-120 mm sizes.

Relatively high percentage of mature and impregnated females of *M.dobsoni* were observed in the month of September, while those of *P.stylifera* were represented in April and November.

Mangalore (Fig. 4)

The trawl fishing declined during the year with an estimated landing of 752.1 t with the catch rate of 5.8 kg/hr against the total catch of 979.7 t and 6.9 kg/hr of the previous year. The catch per hour has decreased from 7.5 kg of 1979 to 6.9 kg of 1980 and 5.8 kg of 1981. The maximum landing of 153.0 t was recorded during December with the catch rate of 7.9 kg per hour. The CPUE was at the highest rate of 8.3 kg during September but the total landing was very low. The landing of

prawns in October was negligible.

M.dobsoni was the dominating species in the landings, forming 45.5 percent of the total prawns. *P.stylifera* was the next species in order of abundance, constituting 42.0 per cent, followed by *M.monoceros* (6.8 per cent), *P.indicus* (36.7 per cent) and *M.affinis* (1.4 per cent). The size range of *M.dobsoni* was 51-120 mm.

Percentage of mature and impregnated females of *M.dobsoni* was high during March-April and September and those of *M.monoceros* in January and March, *M.affinis* in March-April, *P.indicus* in February and *P.stylifera* during February-March.

Calicut (Fig. 5)

The estimated total catch of prawns by trawlers was 111.6 t with the catch rate of 3.93 kg per hour, and this was obviously far below the recorded landing of 355.0 t with the catch rate of 6.8 kg per hour of the previous year. The highest landing

was recorded during December amounting to 48.6 t with the catch rate of 9.1 kg per hour.

Unlike in the previous year, *M.dobsoni* was dominating the trawl catch (56.3 per cent) by relegating *P.stylifera* to the second position (36.7 per cent) in the present year. *M.dobsoni* was represented in the size range of 56-125 mm, while *P.stylifera* was between 51-135 mm. *P.indicus* accounted for 5.67 per cent in the prawn catch. The monsoon and post-monsoon prawn fishery by indigenous gear yielded an estimated catch of 185.1 t and *M.dobsoni* was the major species accounting for 94.8 percent of the total catch, followed by *P.indicus* (30 per cent).

Cochin (Fig. 5)

The total prawn landing at Cochin was estimated at 2549.5 t with an annual catch rate of 47.5 kg per hour as against the estimated total catch of 3465.7 t with the catch rate of 12.9 kg per hour of

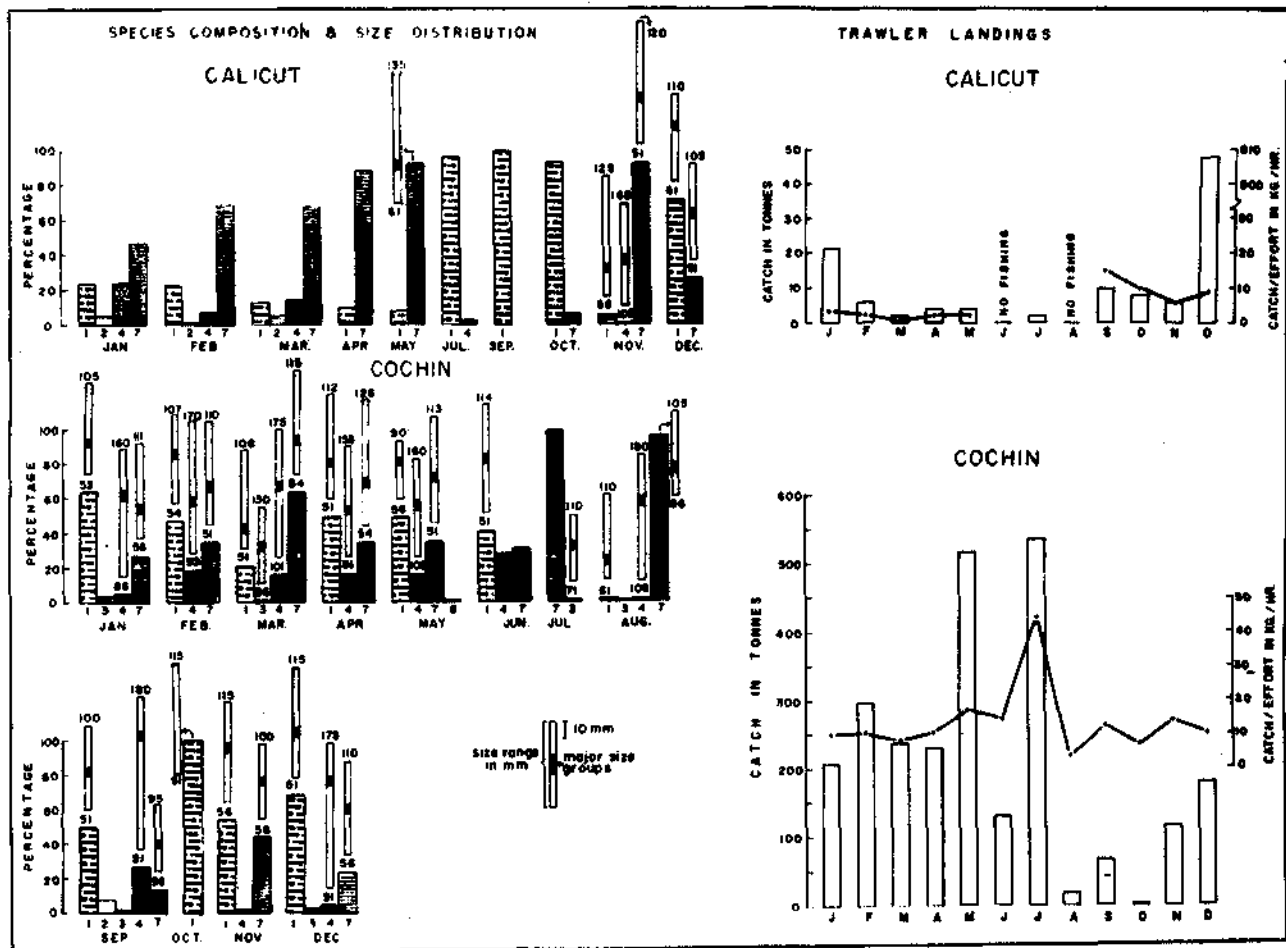


Fig. 5. Catch trend, species composition and size distribution of important species of prawns at Calicut and Cochin during 1981. 1. *M.dobsoni*, 2. *M.monoceros*, 3. *M.affinis*, 4. *P.indicus*, 6. *P.semisulcatus*, 7. *P.stylifera*, 8. Others.

the previous year. May and July recorded the maximum catches of 517.0 t and 530.0 t respectively. Contrary to the dominance of *M.dobsoni* of the previous year, *P.stylifera* was the leading species, accounting for 49.2 per cent followed by *M.dobsoni* (37.7 per cent) *P.indicus* (10.9 per cent) and *M.affinis* (1.1 per cent). August, September and October months recorded lesser catches with gradual increase during December.

P.stylifera in size range of 51-126 mm was represented by both sexes. The dominant size for male was 76-80 mm group while for female it was 81-85 mm. The peak landing for *P.stylifera* took place during July with a total 528.7 t. The fishery for *M.dobsoni* was at its peak during May when the total catch of the same species was estimated at 251.9 t. Male and females of *P.indicus* were represented in the size ranges of 91-180 mm and

86-180 mm respectively for both sexes. This species occurred in good numbers during February to June, with a peak in May (75.2 t).

In case of *M.dobsoni* higher percentage of mature females (38.7%) were seen in March but impregnated females (31.0%) were observed during May. Maximum percentage of mature females of *P.stylifera* were observed in May (41.0%) and August (37.0%). *P.indicus* showed higher percentage of matured females in January to April (Fig. 10).

Neendakara-Sakthikulangara (Fig. 6)

The total prawn landings at Sakthikulangara amounted to 9399.3 t with a catch rate of 17.7 kg per hour, accounting for 22.5 per cent of the total marine landing. In the previous year the total landing was 36,557.9 t with a catch rate of 43.1 kg.

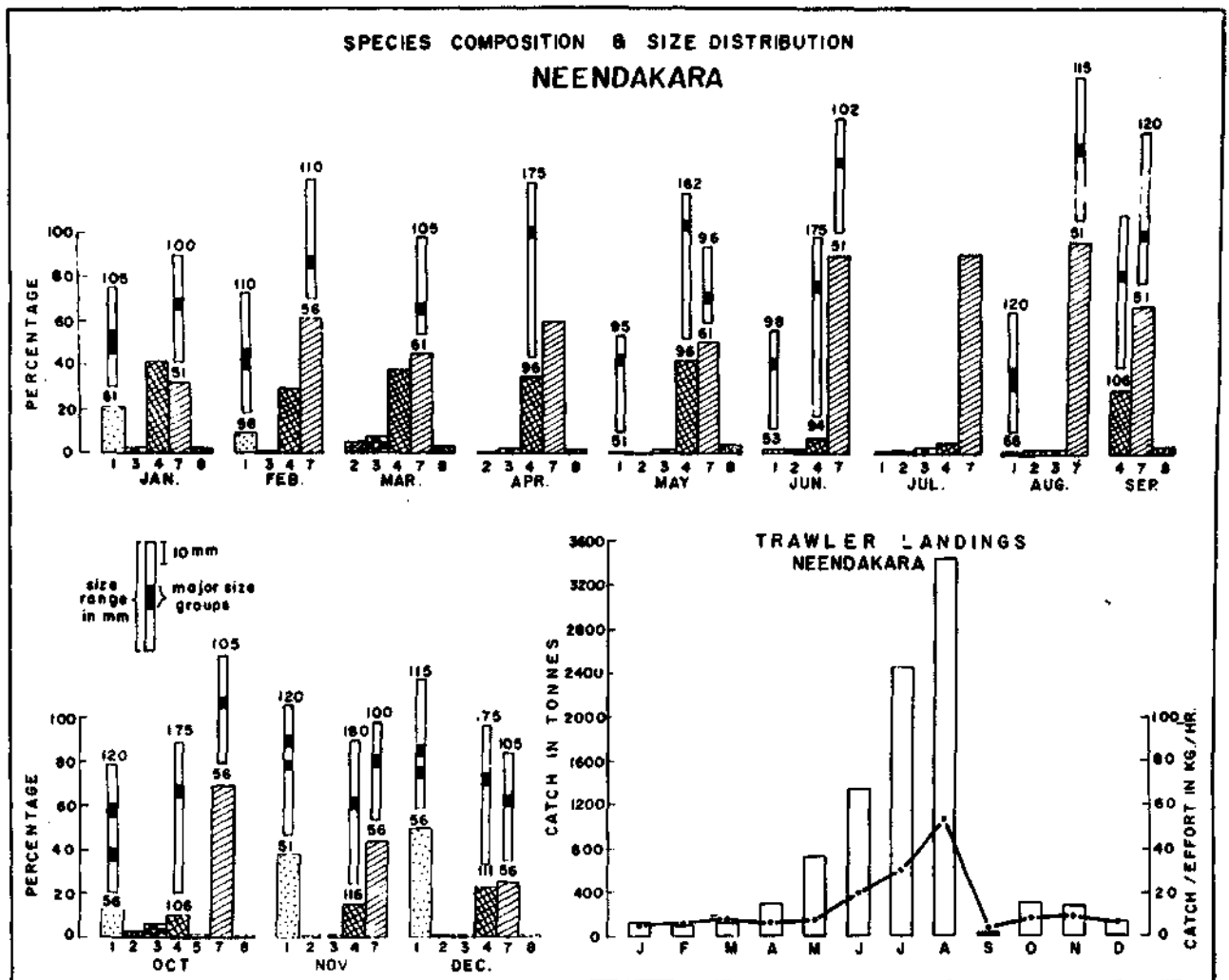


Fig. 6. Catch trend, species composition and size distribution of important species of prawns at Neendakara during 1981. 1. *M.dobsoni*, 2. *M.monoceros*, 3. *M.affinis*, 4. *P.indicus*, 5. *P.canaliculatus*, 7. *P.stylifera*, 8. Other penaeids.

The reduction in the total catch as well as the CPUE implies that heavy rate of exploitation of the species by using more number of boats is taking place in the area, which obviously calls for the measures of judicious exploitation of the resource by limiting the fishing fleet. The considerable decrease in the landing of *P.stylifera* which declined from 33267.7 t (91.0 per cent) of the previous year to 7815.8 t (83.1 per cent) in the present year, was the main reason for the poor status of the prawn fishery. The species next in order of abundance were represented by *P.indicus* 863.2 t (9.2 per cent), *M.dobsoni* (3.5 per cent), *M.affinis* (2.1 per cent) and *M.monoceros* (1.4 per cent). The males of *P.stylifera* were represented by 51-105 mm sizes and females in 51-115 mm. The modes were at 71-75 mm and 81-85 mm for male and female respectively. *P.indicus* was ranging from 96 to 180 mm with a common mode of 151-155 mm for both sexes. Size ranges for *M.dobsoni* were between 51-102 mm for females. The common mode was at 81-85 mm for both sexes.

During May-June period higher percentage of matured females of *M.dobsoni* (37.41%) and in April-June *P.stylifera* (44-51%) were observed in the month of march. Matured females of *P.indicus* were present during June, August and September (Fig. 10).

Tuticorin (Fig. 7)

The prawn fishery during the year 1981 was very good in comparison to that of the previous year. The total catch amounted to 1508.75 t during the year under report as against 404.03 t in the previous year. Although the peak prawn landing period was restricted to the months of June and July the most important constituent species remained to be *P.semisulcatus* (55%), followed by *P.indicus* (44.2%). Record catch of 1080 t was registered in the month of July. *M.dobsoni* formed about 10% of the prawn landings during January-March. The other species of less importance also occurred during this period.

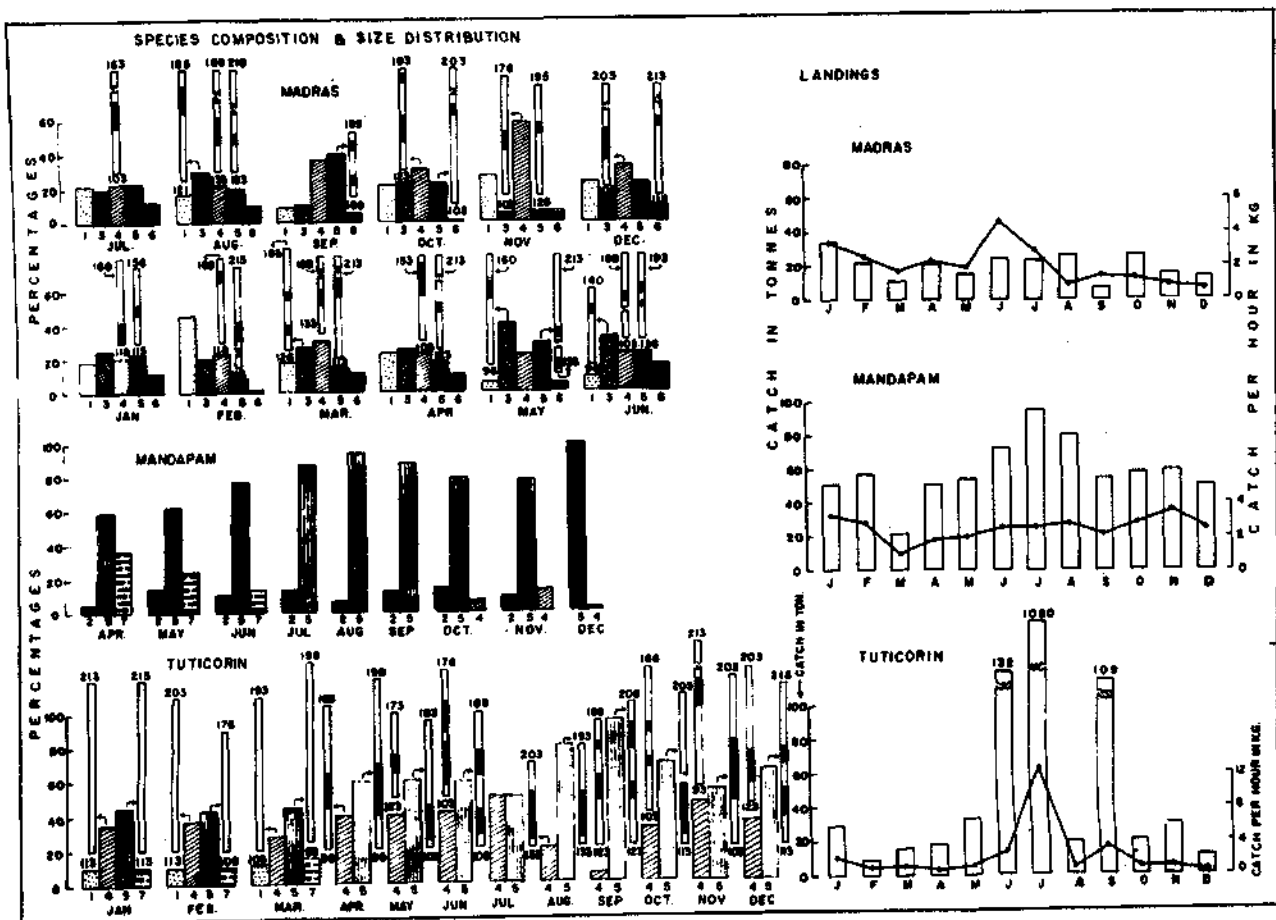


Fig. 7. Catch trend, species composition and size distribution of important species of prawns at Tuticorin, Mandapam and Madras during 1981.

1. *M.dobsoni*, 2. *M.affinis*, 3. *M.monoceros*, 4. *P.indicus*, 5. *P.semisulcatus*, 6. *P.mondon*, 7. Others.

The catch per hour was maximum (12.5 kg) in July while in December it was the least (0.49 kg).

The major size groups represented in the catches of *P.semisulcatus* was 111-195 mm with a size range of 93-218 mm. The spawning activity was at peak during August-November (Fig. 10), during which period 56-91% of the females were with ripe gonads.

Mandapam (Fig. 7)

The prawn landings showed about 1.5 times increase over that of the previous year. Out of the total catch of 707 t about 66.3% was *P.semisulcatus*. There was considerable difference in the species composition of the catches over the months. During the year under report *M.affinis* which was second in importance formed only 7.6% of the catch while it was about 40% in the previous year.

Although the catch per hour was very poor there was no great fluctuation over the months. It ranged from 0.96 to 3.5 kg, the maximum being in November. The effort also varied from 15914 in

January to 37960 in July. The most important constituent of the fishery was *P.semisulcatus* which formed 81.3% of the total prawn catches, the maximum being in the month of July.

Madras (Fig. 7)

The total landings of prawns during 1981 was much more (236.2t) than that of the previous year (173 t). The most important species constituting the fishery was *P.indicus* forming 26.7% of the total landings. This was followed by *M.monoceros* (23.8%), *M.dobsoni* (20.7%), and *P.semisulcatus* (20.2%) in the order of importance. The maximum prawn catch was recorded in January while the percentage of catch of *P.indicus* was highest in November.

The catch per hour ranged from 0.64 kg in December to 4.59 kg in June. The effort expended was maximum in August while it was minimum in September. The major sizes ranged from 116 to 180 mm in *P.indicus* while it ranged from 131 to 190 mm in *P.semisulcatus*. In *M.monoceros* the

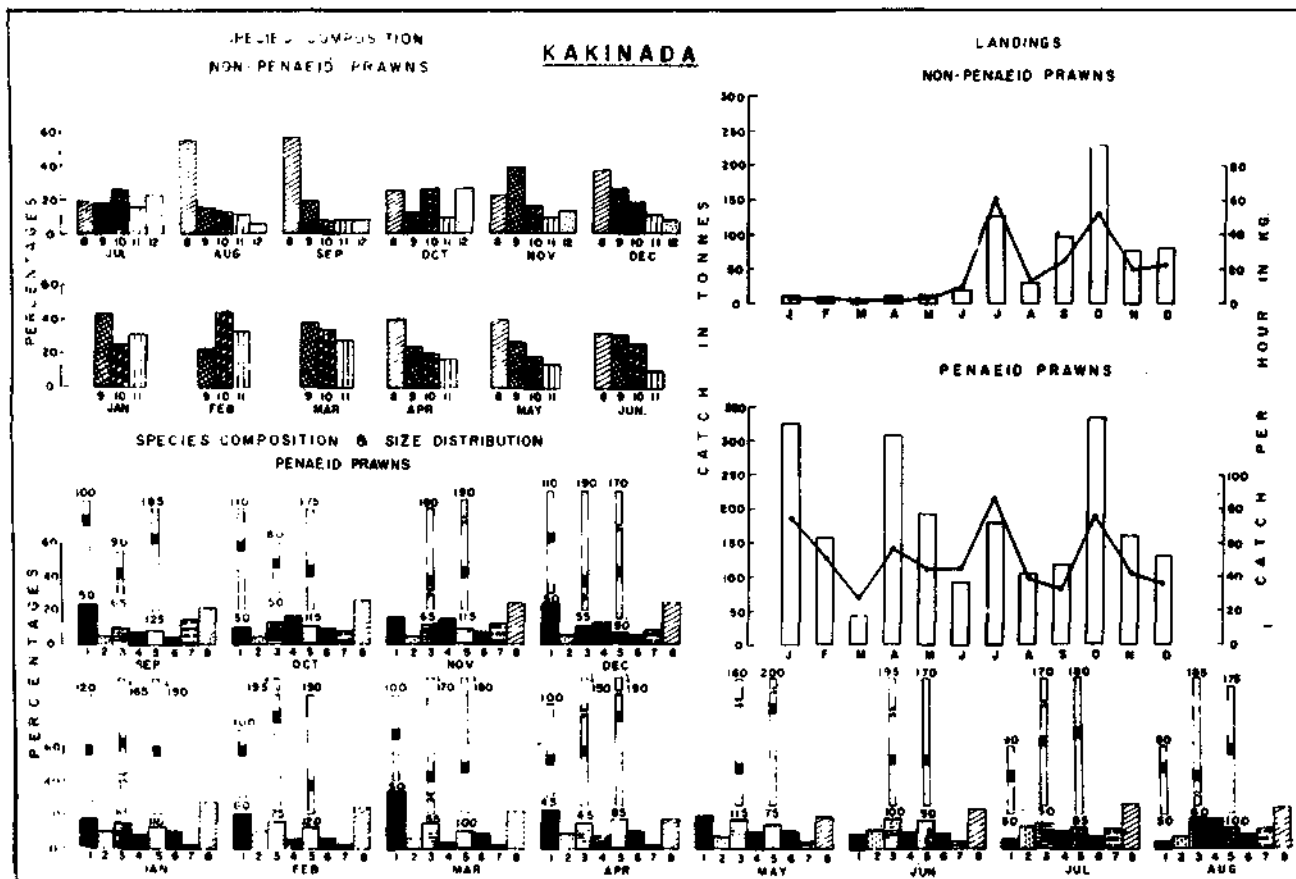


Fig. 8. Catch trend, species composition and size distribution of important species of prawns at Kakinada during 1981. 1. *M.dobsoni*, 2. *M.affinis*, 3. *M.monoceros*, 4. *M.breicornis*, 5. *P.indicus*, 6. *P.mondon*, 7. *P.stylifera*, 8. Other penaeids, 9. *Acetes* spp. 10. *E.styliferus*, 11. *N.tenuipes*, 12. *E.ensirostris*, 13. Other non-penaeids.

major sizes were in the range 126-175 mm.

The spawning activity was maximum during January-April in *P.indicus* and January-March and August-September in *P.semisulcatus*. But in *M.monoceros* majority of females were with fully ripe ovaries during February-March.

Kakinada (Fig. 8)

The penaeid prawn landings of 1981 amounted to 2155.46 t as against 2396.05 t of the previous year. The maximum catch was recorded in the months of October and January. The catch per unit of effort was ranging from 27.4 kg per hour in March to 85.9 kg per hour in July.

The important penaeid prawn constituents of the fishery were *M.dobsoni* (16.0%); *M.monoceros* (14.5%); *P.indicus* (12.3%); *M.brevicornis* (10.7%); *P.monodon* (8.6%); *M.affinis* (8.1%) and *P.stylifera* (6.3%), in the order of abundance.

The important sizes were 66-90 mm in *M.dobsoni*; 66-150 mm in *M.monoceros*, and 116-170

mm in *P.indicus*. The peak spawning seasons were extended from January to April and August to October and December in *M.dobsoni* while in *M.monoceros* it was February-March, May--August and November-December and in *P.indicus* it was from January to April and September.

The non-penaeid prawn catch during the year under report was 707.77 t consisting of 216.4 t of *Acetes* spp., 150.26 t of *Nematopalaemon tenuipes*; 144.22 t of *Exopalaemon styliferus* and 81.46 t of *Exhippolysmata ensirostris*, the remaining being constituted by the less important species. The catch per hour ranged from 1.20 kg in March to 60.15 kg in July.

Waltair (Fig. 9)

The prawn catch during the year was good (768.26 t). The maximum landing was recorded in February (179.06 t) and the lowest in April (5.78 t).

The CPUE range was from 1.1 kg per hour in April and May to 5.01 kg per hour in February. *M.monoceros* formed 41.9%, followed by *M.stridulans*

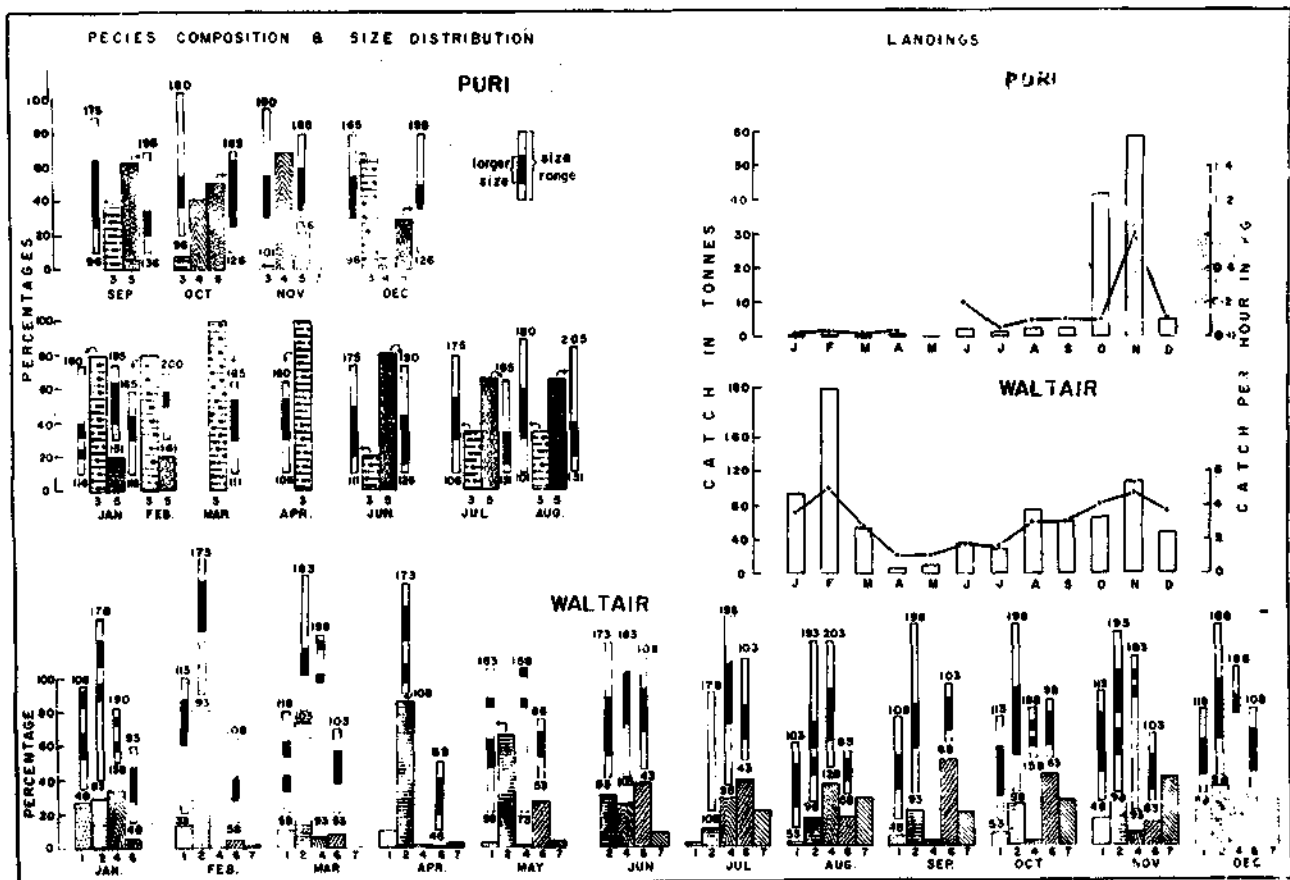


Fig. 9. Catch trend, species composition and size distribution of important species of prawns at Waltair and Puri during 1981. 1. *S.crassicornis*, 2. *M.monoceros*, 3. *M.affinis*, 4. *P.indicus*, 5. *P.merguensis*, 6. *M.stridulans*, 7. Others.

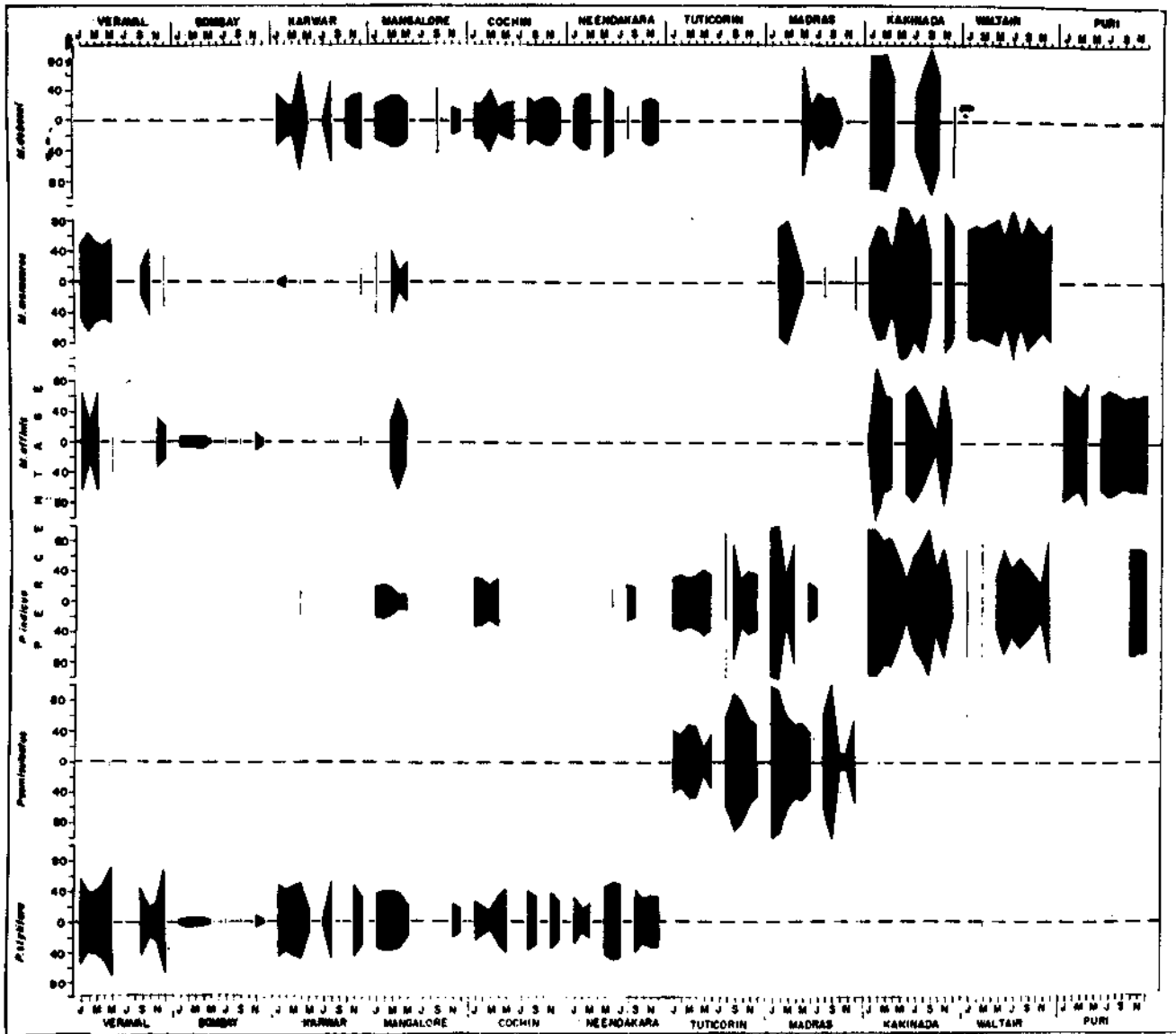


Fig.10. Distribution of the spawning population of important species at selected centres during 1981.

ians (18.3%), *P.indicus* (12.4%), *S.scrassicornis* (11.7%), *M.dobsoni* (6.8%) and *P.monodon* (5.3%). The major sizes were from 106 to 165 mm in *M.monoceros*; 136-195 mm in *P.indicus* and 56-100 mm in *M.stridulans*. The maximum percentages of mature females were recorded during January to May-July and September to December in the case of *M.monoceros* while in *P.indicus* it was during the first four months of the year and in September and in *M.stridulans* majority of females were immature throughout the year.

Puri (Fig. 9)

The prawn landings by indigenous gears showed a marked increase (114.88 t) over that of the previous year (52.07 t), coming close to the lan-

dings of 1978. The catches were poor during the first four months, but picked up by August and reached maximum in October-November period. The catch per hour was very poor in most of the months except in October and November (0.87 and 1.13 kg/hr).

The species composition was also slightly changed during the year. *P.monodon* formed a fishery of very little magnitude during October-December. *P.indicus* was also present only during this period. Otherwise, the most important species remained to be *P.merguensis*, followed by *M.affinis* while the latter was the dominant species in the previous year.

The major sizes were 111-155 mm in *M.affinis*

and 131-190 mm in *P.merguiensis*. In *P.indicus*, 146-170 mm was dominant size.

The females of *M.affinis* were mostly ripe (57.58-79.31%) throughout the year; but the peak spawning period was during the months of Janu-

ary, April and July when more than 70% of the females were with ripe ovaries. In *P.merguiensis*, the condition of maturity was more or less similiar with peak season in January-February, August and December, crossing the 70% mark.

