

ON 'DOL' NET PRAWN FISHERY OF BOMBAY DURING 1966-76

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ABSTRACT

The best prawn catches of 2330.4 t at Versova were in 70-71 and 1917.5 t at Sassoon Docks were in 1968-69. The peak fishery was generally during October-December and March-May. The fishery was supported mainly by seven species of penaeids and three species of non-penaeids; the latter contributing up to 80% of the catches obtained in Dol nets.

INTRODUCTION

The prawn fishery in Maharashtra, unlike in other maritime states in India, is supported by a number of species, each contributing to a fishery of varying magnitude. Information on the prawn fishery of this area is derived largely from the accounts given by Rai (1930), Chopra (1943), Shaikmahmud and Tembe (1960), Kunju (1967) and Mohamed (1967). Recent years have witnessed the conversion of a large number of Dol units into trawling units, resulting in appreciable changes in the trend of the prawn fishery in the area. Results of investigations conducted on the resources of prawns in the Bombay waters from 1966-67 through 1975-76 are dealt with here.

MATERIAL AND METHODS

Versova and Sassoon Docks, two important landing centres in Bombay, were visited regularly for collecting catch statistics. Each boat-net combination was taken as a unit. On an average, 20% of the units operated were observed for estimating the day's catch, based on which the catch for month was computed. The rate of exploitation is expressed by the catch per unit effort (CPUE).

A random sample collected on each day of observation was analysed to estimate the species composition and relative abundance by weight and numbers of the different species.

FISHERY

The prawn fishery by indigenous Dol nets generally commences in the area by September-October, after the south-west monsoon, and ceases by late

May or early June at Versova, whereas, it continues unabated at Sassoon-Docks. (For details of Dol net see Setna 1949). These nets were operated at a depth of 30-40 m at Versova and at 10-15 m at Sassoon Docks.

Monthwise catch and CPUE of prawns for different years at Versova and Sassoon Docks are given in Fig. 1. The best catches and highest CPUE values

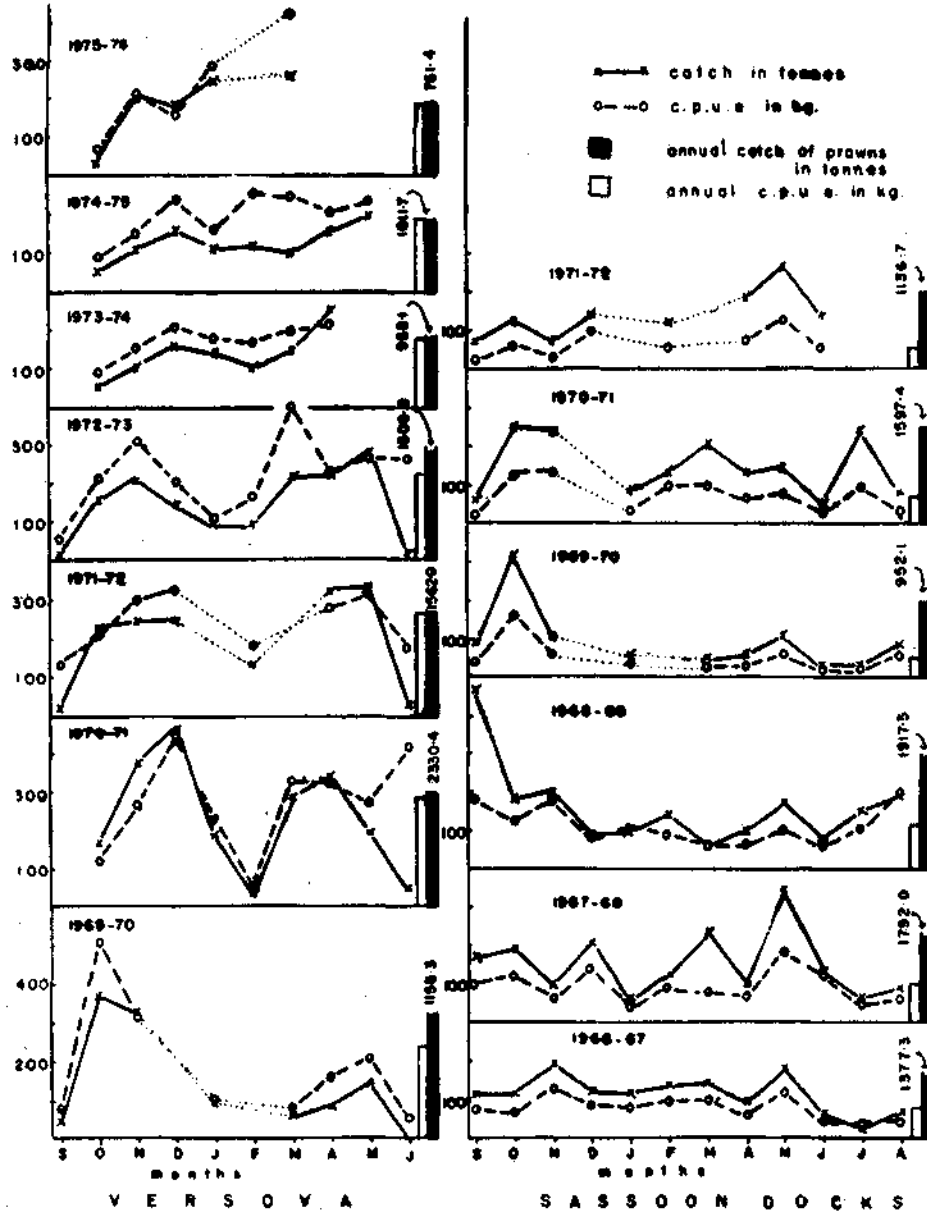


FIG. 1. Month-wise and annual prawn catches and CPUE during different fishing seasons at Versova and Sassoon Docks.

were obtained during 1970-71 at Versova (2330.4 t and 286.6 kg, respectively), whereas, at Sassoon Docks it was in 1967-68 (1917.5 t and 114.2 kg, respectively).

The average annual catch was estimated to be 1325.2 t at the former centre (1969-70 to 1975-76) and 1462.2 t at the latter centre (1966-67 to 1971-72). Kunju (1967) recorded a mean yearly landing of 3173.1 t and 2152.9 t respectively at these centres for the period 1959-63. Thus a decline in the yield by over 30% at Versova and by 50% at Sassoon Docks is noticeable over the years. During the period of the present investigations also a steady decline in catch was discernible from the earlier years towards 1975-76.

It could be seen from Fig. 1 that the peak catches were obtained mostly during October-December and March-May at both the centres.

Species composition

The species contributing to the fishery are more or less the same as reported by Kunju (1967), namely, *Metapenaeus affinis*, *M. brevicornis*, *Parapenaeopsis stylifera*, *P. hardwickii*, *P. sculptilis*, *Solenocera crassicornis* and *Atypopenaeus stenodactylus*, and non-penaeids like *Acetes indicus*, *Palaemon tenuipes* and *Hippolytina ensirostris*.

The non-penaeids contributed to the bulk of the prawn catch and formed about 70-80% of the prawns caught in Dol nets. *Acetes indicus* and *Palaemon tenuipes* formed the major constituents of the non-penaeid catch and one or the other was found to dominate in the fishery during the different months. Month-wise species composition and relative abundance of various prawns during different seasons at Versova and Sassoon Docks are presented in Figs. 2 and 3.

The catches of the different species of prawns, their percentage composition together with CPUE during different seasons at Versova and Sassoon Docks are given in Tables 1 and 2 respectively. The sergestid shrimp *Acetes indicus* was by and large the most important species that contributed to the bulk of the annual catch in all the seasons at both the centres, except during 1969-70 when *P. stylifera* was landed in fairly large quantities relegating *A. indicus* to a third place. However, the best catches of *A. indicus* was obtained during 1970-71 (1464.8 t) at Versova and during 1968-69 (1009.0 t) at Sassoon Docks.

In 1969-70, *P. stylifera* registered a catch of 262.4 t and 222.9 t at the former and latter centres respectively.

Seasonal variations in catches

During October-December and March the landings of the dominant species *Acetes indicus* was considerably high and the maximum catch was realised during that period in 1970-71 at Versova. At Sassoon Docks, catches of this species were generally high during November-December and the best catches

were recorded during the same period in 1968-69. Bulk of the *Palaemon tenuipes* was landed during March-May when more than half of the annual catch was recorded at both the centres.

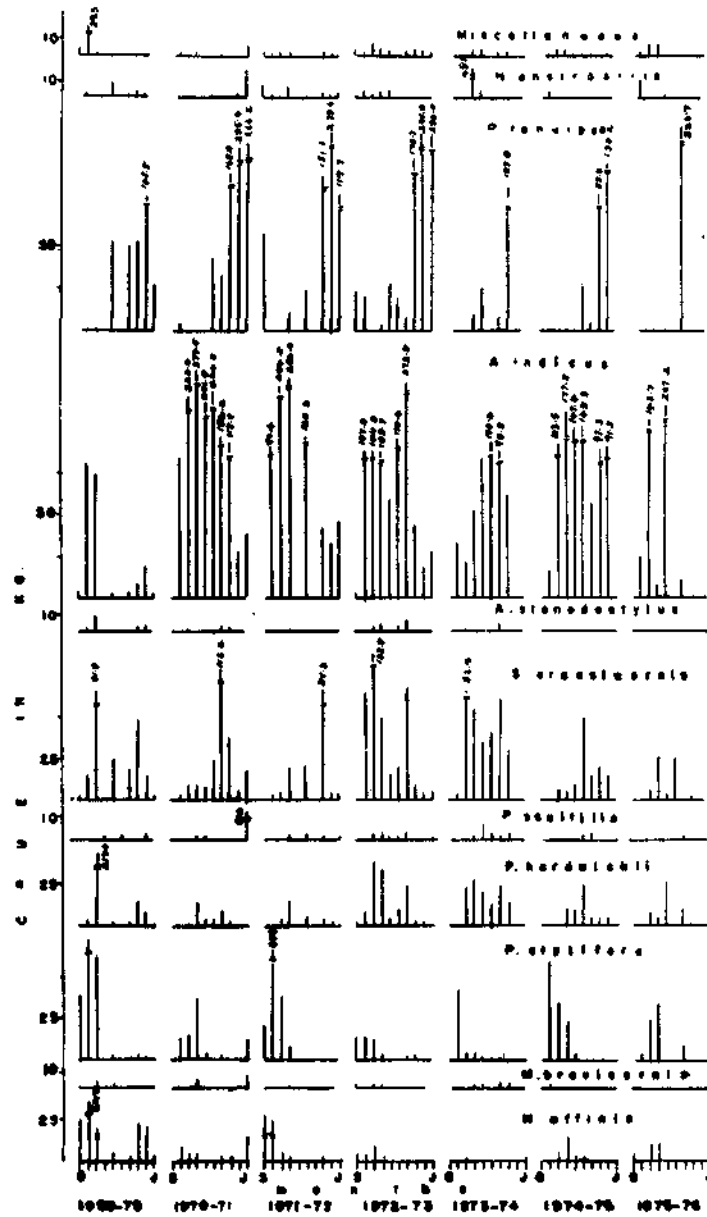


FIG. 2. Month-wise relative abundance of the various category of prawns during different years at Versova.

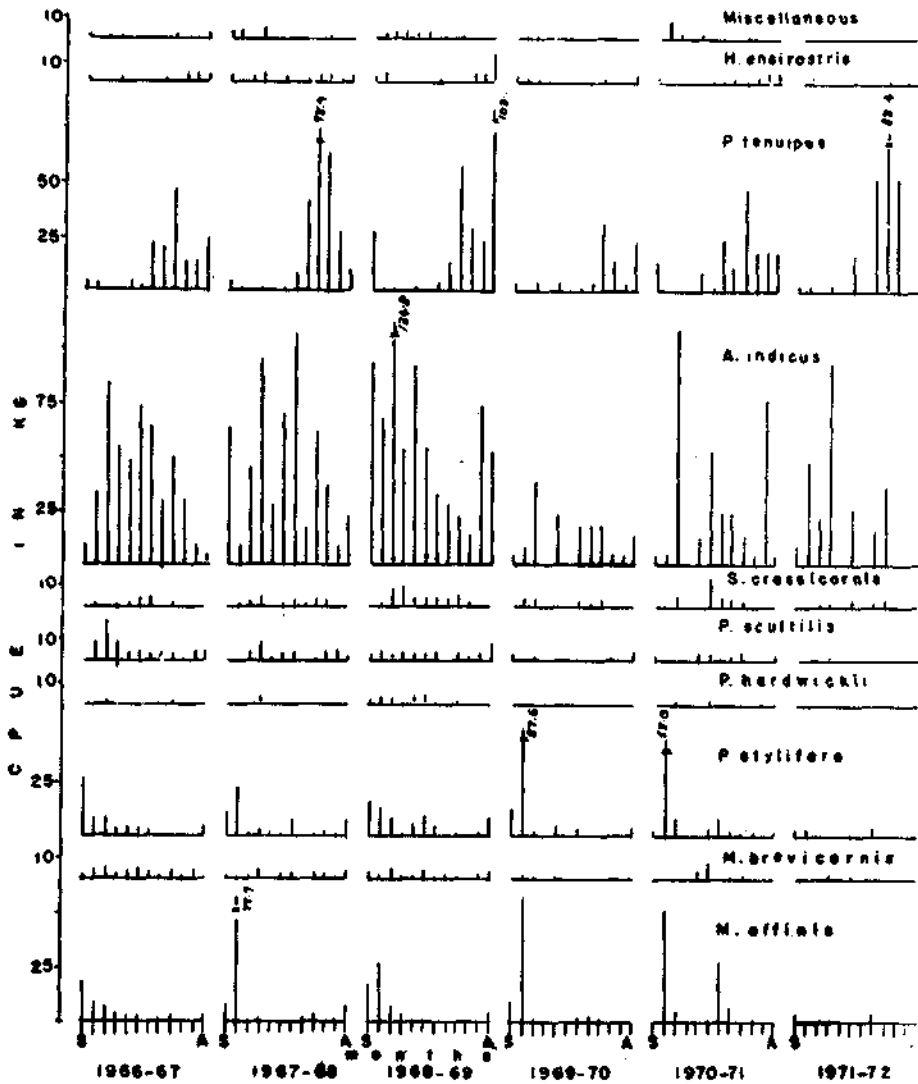


FIG. 3. Month-wise relative abundance of the various category of prawns during different years at Sassoon Docks.

The catches of *Metapenaeus affinis* was generally better during September-November and April-May. The highest catch of 115.5 t, which formed 82% of the annual catch of the species, was obtained during October 1969 at Versova. At Sassoon Docks, maximum yield of 111.7 t (74%) was recorded during October 1969.

October-December appears to be the peak season in respect of *P. stylifera* and highest catch of 227 t (86.5%) was recorded during October-November

TABLE 1. Estimated season-wise catch in tonnes (C), catch per trip in kg (C/t) and percentage composition (%) of prawns at Versova.

		1960-70	1970-71	1971-72	1972-73	1973-74	1974-75
<i>M. affinis</i>	C	186.0	39.0	39.6	14.8	4.5	14.6
	C/t	38.5	4.8	6.9	2.3	0.9	2.8
	%	16.1	1.7	2.5	1.0	0.5	1.4
<i>M. brevicornis</i>	C	6.5	5.2	4.0	5.0	4.5	2.4
	C/t	1.3	0.6	0.7	0.8	0.9	0.4
	%	0.6	0.2	0.3	0.3	0.5	0.2
<i>P. stylifera</i>	C	262.4	98.7	135.9	27.6	43.1	80.6
	C/t	54.3	12.2	23.6	4.3	8.1	15.3
	%	22.7	4.2	8.7	1.8	4.5	8.0
<i>P. hardwickii</i>	C	79.0	42.2	30.5	88.3	96.5	33.4
	C/t	16.3	5.2	5.3	13.8	18.2	6.3
	%	6.8	1.8	2.0	5.9	10.1	3.3
<i>P. sculptilis</i>	C	5.5	8.3	6.8	9.5	16.9	4.6
	C/t	1.1	1.0	1.2	1.5	3.2	0.9
	%	0.5	0.4	0.4	0.6	1.8	0.5
<i>S. crassicornis</i>	C	173.6	200.7	134.0	255.0	228.6	72.5
	C/t	35.9	24.9	23.3	39.8	43.2	13.8
	%	15.0	8.6	8.6	16.9	23.9	7.2
<i>A. stenodactylus</i>	C	18.9	11.5	3.0	13.8	4.8	0.6
	C/t	3.9	1.4	0.5	2.2	0.9	0.1
	%	1.6	0.5	0.2	0.9	0.5	0.1
<i>A. indicus</i>	C	168.7	1464.8	680.7	570.5	357.3	552.4
	C/t	38.9	181.6	118.5	88.9	67.5	104.9
	%	14.6	62.9	43.6	37.9	37.3	54.6
<i>P. tenuipes</i>	C	232.4	442.7	512.7	492.6	156.4	232.0
	C/t	48.1	54.9	89.2	76.8	29.6	44.0
	%	20.2	19.0	32.8	32.7	16.3	22.9
<i>H. ensirostris</i>	C	12.5	6.8	8.8	9.5	37.2	5.3
	C/t	2.6	0.8	1.5	1.5	7.0	1.0
	%	1.1	0.3	0.6	0.6	3.8	0.5
Miscellaneous	C	9.7	10.5	6.9	20.2	8.3	13.3
	C/t	2.0	1.3	1.2	3.2	1.6	2.5
	%	0.8	0.4	0.3	1.4	0.8	1.3
Total	C	1155.2	2330.4	1562.9	1506.8	958.1	1011.7
	C/t	239.3	286.6	271.8	235.8	181.4	192.3

1969 at Versova. The landings were better during October 1969 (116.5 t) and October 1970 (113.9 t) at Sassoon Docks. Catches of *P. hardwickii* were relatively high during November-December and in March at Versova, whereas, at Sassoon Docks the catches were generally low. Peak catches of *Solenocera crassicornis* were generally obtained during October-November and March-April at Versova. The highest catch of 138 t was obtained during October-November 1972 at this centre. The landing of this species was only moderate at Sassoon Docks.

Penaeid prawns like *M. monoceros*, *Penaeus monodon*, *P. merguensis*, *P. penicillatus*, *P. japonicus* and *Metapenaeopsis stridulens* were found to occur in small numbers in the catches at Versova where Dol nets are being operated at slightly deeper waters. The landings of *M. monoceros* and *P. merguensis* (size ranging from 150-180 mm in both cases) were unusually high on certain days

TABLE 2. Estimated season-wise catch (C) in tonnes, catch per trip (C/t) in kg and percentage composition (%) of prawns at Sassoon Docks.

		1966-67	1967-68	1968-69	1969-70 ¹	1970-71 ²	1971-72 ³
<i>M. affinis</i>	C	91.7	170.9	110.9	151.3	211.6	29.6
	C/t	5.4	9.7	6.6	8.4	9.7	1.7
	%	6.6	9.5	5.7	15.8	13.3	2.6
<i>M. brevicornis</i>	C	38.7	42.9	48.5	14.6	32.2	9.5
	C/t	2.3	2.4	2.9	0.8	1.5	0.5
	%	2.8	2.4	2.5	1.5	2.1	0.8
<i>P. stylifera</i>	C	112.1	110.0	115.9	222.9	117.2	28.7
	C/t	6.6	6.2	6.9	12.5	8.1	1.6
	%	8.1	6.1	6.0	23.4	11.2	2.5
<i>P. hardwickii</i>	C	11.5	14.4	36.2	7.6	9.1	3.2
	C/t	0.7	0.8	2.2	0.4	0.4	0.2
	%	0.8	0.8	1.9	0.8	0.5	0.3
<i>P. sculptilis</i>	C	102.7	53.2	68.0	22.0	39.0	16.9
	C/t	6.1	3.0	4.0	1.2	1.8	1.0
	%	7.4	3.0	3.5	2.3	2.4	1.5
<i>S. crassicornis</i>	C	28.9	39.3	55.1	26.2	59.0	16.1
	C/t	1.7	2.2	3.3	1.5	2.7	0.9
	%	2.1	2.2	2.9	2.8	3.7	1.4
<i>A. indicus</i>	C	722.2	905.7	1009.9	287.1	644.3	511.2
	C/t	42.8	51.3	60.1	16.1	29.6	29.1
	%	52.4	50.5	52.7	30.1	40.6	45.0
<i>P. tenuipes</i>	C	230.7	388.4	386.3	180.4	348.7	488.0
	C/t	18.7	22.0	23.0	10.1	16.0	27.0
	%	16.7	21.7	20.1	18.9	22.0	42.9
<i>H. ensirostris</i>	C	25.3	42.2	57.2	26.7	40.1	26.4
	C/t	1.5	2.4	3.4	1.5	1.8	1.5
	%	1.8	2.4	3.0	2.8	2.5	2.5
Miscellaneous	C	13.6	24.9	29.6	13.4	35.2	7.1
	C/t	0.8	1.4	1.8	0.8	1.6	0.4
	%	1.0	1.4	1.5	1.4	2.1	0.7
Total	C	1377.3	1792.0	1917.5	952.1	1997.4	1136.7
	C/t	81.6	101.5	114.2	53.0	73.1	64.9

1 - No observation in December and February, 2 - No observation in December, 3 - No observation in January, March, July and August.

in November and December 1975 and even up to one tonne was caught in a single day at this centre. *Metapenaeopsis stridulens* was landed in sizeable quantities in November 1971 at Sassoon Docks.

In addition to the above mentioned species of prawns, penaeids like *P. semisulcatus*, *P. canaliculatus*, *M. dobsoni*, *Metapenaeopsis mongiensis* and non-penaeids such as, *Palaemon styliferus*, *Hippolyasmata vittata*, *Macrobrachium rosenbergii*, *Macrobrachium idae* and *Tozeuma* sp. were recorded in stray numbers in Dol net catches during the period of present study.

DISCUSSION

Among the penaeids *Metapenaeus affinis*, *M. brevicornis*, *Parapenaeopsis stylifera*, *P. hardwickii*, *P. sculptilis*, *Solenocera crassicornis* and *Atypopenaeus*

stenodactylus occur in sizeable quantities and are of commercial importance, while among the non-penaeids, *Acetes indicus*, *Palaemon tenuipes* and *Hippolyssmata ensirostris* are the common species. From the point of view of maximum catches non-penaeid prawns are of greater importance than penaeids, forming 70 to 80% of the Dol net prawn catches.

A steep fall in the prawn catches over the years from a mean annual average of 3173.1 and 2151.9 t during 1959-63 (Kunju 1967) to 1325.2 t (1969-76) and 1462.2 t (1966-72) at Versova and Sassoon Docks respectively has been noticed.

In their study on the prawns of Bombay, Shaikmahmud and Tembe (1960) reported that *Penaeus indicus*, *Parapenaeopsis maxillipedo* and *Metapenaeus monoceros* occur in the Dol net catches in fairly large quantities. But it is interesting to note that during the present investigations of over several years, these species were hardly represented in the catches. *P. penicillatus* is found in the place of *P. indicus*, as observed by Kunju (1967) also. *P. merguensis* is caught in large quantities from south of Bombay and Goa region by the larger offshore fishing vessels. While *M. monoceros* does not contribute to the Dol net fishery, it is caught in sizeable quantities in trawl nets operating from Sassoon Docks during the post-monsoon period particularly during October-November.

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