CMFRI
bulletin 44
Part One

JUNE 1989

NATIONAL SYMPOSIUM ON RESEARCH AND DEVELOPMENT IN MARINE FISHERIES

MANDAPAM CAMP
16-18 September 1987

Papers Presented
Sessions I & II

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
P. B. No. 2704, E. R. G. Road, Cochin-682 031, India

Central Marine Fisheries Research Institute
40
YEARS
1947-1987

SHRIMP FISHERY OF BOMBAY COAST

M. Aravindakshan and J. P. Karbhari
Central Marine Fisheries Research, Institute, Cochin-31.

ABSTRACT

With the introduction of the mechanised trawlers, the shrimp fishery of Maharashtra coast especially of Bombay region has shown considerable variations both in species composition and in the magnitude of the landings. A study was therefore made for a five year period from 1982-1986 to understand the trend of prawn fishery Two important centres namely Versova and Sassoon dock were selected to cover the mechanised 'Dol' fishery and trawl fishery respectively The results are presented alongwith the problems of management when mechanisation is on the increase enabling the fishermen to explore deeper areas hitherto not fished at all.

INTRODUCTION

The shrimp fishery of Bombay coast has been studied by many workers earlier. A detailed account of the fishery of the region has been given by Shaikmohamed and Tembe (1960), Kunju (1967), Mohamed (1967), Kagwade (1967) Rao *et al* (1966, 1968), Aravindakshan and Karbhari (1983) and Chakraboty *et al* (1983). These authors have reported the different aspects of the shrimp fishery by the traditional 'Dol' nets and the modern trawl nets. A recent study by Aravindakshan and Karbhari (1983) indicates that penaeid prawns earlier reported to have no fishery value are entering the fishery adding additional varieties to the fishery. A study of the trawler catches at Sassoon dock for penaeid prawns and 'Dol' net catches at Versova for bag net landings for penaeid and non-penaeid prawns are presented in this paper, to understand the trend of the landings by the respective gear and also managerial problems that may arise due to landing of new varieties hitherto fished little, or not at all.

MATERIAL AND METHODS

The fish landing centres were visited once a week for observation of landings and collection of samples for biological studies in the laboratory later.

The survey data collected by the field staff of the centre and processed have also been utilised for detailed analysis and presentation.

Craft and gear:

Craft and gear for the fishery are the same described by Chakraborty *et al* (1983). The area of fishing extends up to Ratnagiri in the south from Bombay base for trawlers and for 'Dol' nets off Versova coast up to a depth of 40 m.

Fishing season

At Versova complete suspension of fishing is observed from first week of june to the end of August. The trawl operations are continuous at S. dock though suspended for a few days when weather conditions are unfavourable during monsoon months.

Fishery:

The total landings at both centres for the five year period are given for S. dock and Versova (Fig. 1). Only penaeid prawn landings are considerd for S. dock while both penaeids and non-penaeids are noted for catch data at Versova. This is due to the fact that non-penaeids by trawl nets at S. dock are represented only during some months.

Catch trend of penaeids at S. dock, as given in Table 3 shows only small deviations except for years 1983 and 1984, when highest and lowest landings are recorded.

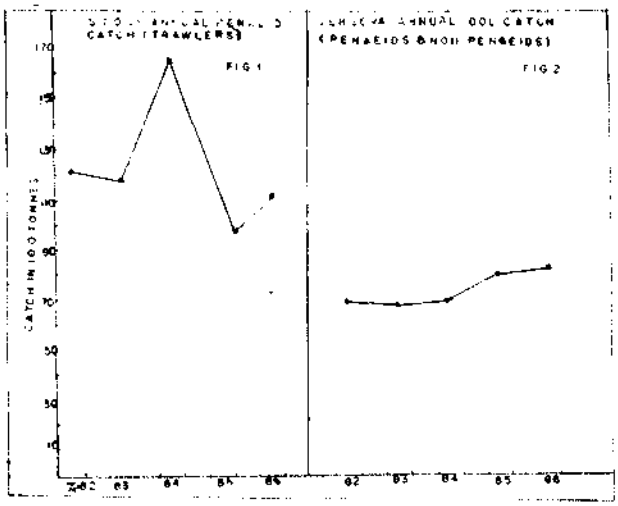

Fig. 1. Catch trend of prawns at S. dock and Versova

Catch per unit effort during these two years does not show deep deviations. The average c.p.u.e. works out to be 23.1kg/hr. The percentages of penaeids in total fish also do not show significant variation indicating that degree of exploitation is stable.

At Versova (table 3) the catch shows a steady trend for three years from 1982 to 1984 and an increase in catch for 1984 and 1985. With regard to c.p u.e. the same trend is maintained. Highest c. p. u. e. is registered in 1986 and the lowest in 1983, the average for the five years being 53.9 kg/hr. From the trend of fishery with regard to total landings and c.p.u.e. it appears that exploitation is steady for 'Dol' fishery at Versova during the period of study.

Major species that contribute to the fishery

The major species that contribute to the fishery at S. dock and Versova are listed below as they are important for management.

S. dock Trawl

1. *Metapenaeus affinis*
2. *M. monoceros*
3. *Parapenaeopsis stylifera*
4. *M. brevicornis*
5. *Solenocera crassicornis*
6. *S. chopora*
7. *Metapenaeopsis stridulans*
8. *M. hilraula**
9. *Parapenaeus longipes*
10. *Trachypenaeus longipes*
11. *Penaeus japonicus*
12. *M. dobsoni**
13. *P. penicillatus*
14. *P. monodon*
15. *P. semisulcatus**
16. *Atypeopenaeus stenodactylus*
17. *Parapenaeus stenodactylus*
18. *P. hardwickii*

Versaova (Dol)

1. *M. affinis*
2. *M. monoceros*
3. *P. stylifera*
4. *M. brevicornis*
5. *S. crassicornis*
6. *M. stridulans*
7. *M. stenodactylus*
8. *P. penicillatus*
9. *P. sculptilis*
10. *P. hardwickii*
11. *P. japonicus**
12. *Acetes indicus*
13. *A. johni*
14. *A. japonicus**
15. *Nematopalaemon tenuines*
16. *Exhippolysmata ensirostris*
17. *Exopalaemon styliferus*

TABLE 1

Percentage of major penaeid prawns in Trawler catches at Sasoon dock

Species	(Annual average) 1882	1983	1984	1985	1986
Penaeus spp	4.1%	2.6%	4.3%	6	4
Metapenaeus affinis	20.5	36	23.2	24	23
M. monoceros	22.4	10.4	15	23.7	15
M. brevicornis	5	2	3	4.6	3
Parapenaeopsis stylifera	26.9	38	47	29.4	47
Solenocera spp	10.6	6.2	2.6	3.7	2
Metapenaeopsis stridulans	4.4	2.3	4	7.8	5
Parapenaeus longipes	1.4	.5	0.5	0.4	0.5
Misc	4.7	2	0.5	0.4	0.5

TABLE 2

Percentage of major prawn species in 'dol' catches at Versova (Annual average)

Species	*1982*	*1983*	*1984*	*1985*	*1986*
Acetes sp	69.0	70.0	70.6	65.2	55.0
Nematopalaemon tenuipes	18.0	16.9	18.1	18.2	31.2
Parapenaeopsis stylifera	4.0	5.6	3.4	7.1	3.7
Solenocera crassicornis	3.4	3.1	3.1	5.1	4.8
Exhippolysmata encrostris	1.6	2.9	3.1	0.8	0.4
Parapenaeopsis sculptilis	0.9	0.9	0.8	0.5	2.6
Parapenaeopsis hardwickii	1.0	0.1	—	1.0	0.9
Metapenaeus brevicornis	0.4	0.05	0.2	0.8	0.6
Metapenaeus affinis	0.3	—	—	0.6	0.5
Penaeus monodon	0.5	0.2	—	—	—
Penaeus penicillatus	0.4	0.2	—	—	—
Miscellaneous	0.5	0.05	0.7	0.8	—

TABLE 3

Consolidated catch with c. p. u. e. for 1982-1986 (Sasoon dock & Versova)

	Units	Total prawn catch (Kg) with c. p. u. e. in paranthesis	Total Fish (Kg)	Prawn percentage total fish (%)
		S. dock (Trawl net)		
1982	24689	12216308(20.6)	47640015	25.5
1983	28505	11766860(17.2)	25587367	45.9
1984	21045	16664427(33)	33946410	49.1
1985	20447	9825239(20.0)	27217544	27.7
1986	18902	11261838(24.8)	33432834	33.6
Total	113588	61734672 (23.12 average)	197924170	36.4 (average)
		Versova (Dol net)		
1982	14620	6919386(47.37)	12243181	56.5
1983	16848	6719691(41.8)	14784448	44.5
1984	14851	6919386(46.5)	12243181	56.5
1985	12974	8547629(65.8)	12701856	67.2
1986	12852	8754952(68.1)	24013265	36.5
Total	71345	37860944 (average)	75985931	52.2 (average)

Yearwise percentage composition of different species have been given in tables 1 and 2. It can be seen from the tables that the percentage composition of penaeid prawns in trawl fishery is dominated by *P. stylifera* *M. affinis* and *M. monoceros* and *Solenocera* spp. (*S. crassicornis* and *S. choprai*) respectively followed by other penaeid species. For Versova 'Dol' landings are dominated by *Acetes* spp (mainly *A. indicus* and *A. johni)* followed by *N. tenuipes*. These two groups are found to contribute to more than 80% of 'Dol' catches at Versova.

This finding is also close to the report of Rajan *et al* (1982) with regard to percentage of non penaeids contributing to 'Dol' fishery at Versova. Major penaeids that are found to support the 'Dol' fishery are *P. stylifera* and *S. crassicornis*. These two species formed about 7-12% of 'Dol' catches. *A. sibogae* though forms a fishery at Trombay 'Bag net' (Machardani) is not noticed in the present study.

The studies reveal that the trends of penaeid prawn landings at Sassoon dock do not show sharp decline in the catches requiring restrictions of mesh size of trawl nets and hours of effective fishing. In the case of 'Dol' fishery a slight change in species dominance noted by Rajan *et al*, (Op. cit) is found to be persisting. Appearance of *A. johni* as a dominant contributor to the fishery also calls for fresh studies on *Acetes* populations in the area for the purpose of management.

ACKNOWLEDGEMENT

The authors are deeply thankful to Dr. P. S. B. R. James, Director of Central Marine Fisheries Research Institute, Cochin for his kind interest in the preparation of this paper presented at the symposium.

REFERENCES

ARAVINDAKSHAN, M. AND J. P. KARBHARI 1983. Kuruma shrimp fishery from Bombay waters. *Mar. fish. infor. serv. T & E Ser. 47* 9-12.

ARAVINDAKSHAN, M AND J. P. KARBHARI 1983. New penaeid prawn resources showing along Maharashtra coast. *Ibid.*, 58 : 10-13.

CHAKRABORTY S.K, V.D. DESHMUKH, KUBER VIDYASAGAR AND S. RAMAMURTHY 1983 By-catch of shrimp trawlers in greater Bombay. *Ibid.*, 54 : 7-15.

KAGWADE, P. V. 1965. Prawn catches of mechanised vessels in the trawling grounds of Bombay and Saurashtra. *Proc. Symp. Crustacea. Mar. biol. Ass.* India 4 : 1548-1381.

KUNJU, M. M. 1967. Observations on the prawn fishery of the Maharashtra coast. *Ibid.*, 1382-1397.

MOHAMED. K. H. 1967. Penaeid prawns in the commercial shrimp fisheries of Bombay with notes on species and size fluctuations. *Ibid.*, 1408-1418.

RAO, K. VIRABHADRA, P. T. MEENAKSHI-SUNDARAM AND K. DORAIRAJ 1966. Relative abundance of trawl fishes in the Bombay and Saurashtra waters. *J. Mar. Biol. Ass. India*. 8 : 205-212.

RAO, K. VIRABHADRA, K. DORAIRAJ, P. V. KAGWADE AND D.M. PUNWANI 1968. Results of the exploratory fishing operations of the Govt of India vessels at Bombay base for the period 1961-67. Symposium on Demersal Fisheries 13th Session, Brisbane Australia, preprint *IFPC C 68/Svm.* 28.

RAJAN, K. N., K. K. SUKUMARAN AND S. KRISHNA PILLAI. 1982. On 'Dol' net prawn fishery of Bombay during 1966-76. *Indian J. Fish* 29 (1 & 2) : 29-36.