

ESTIMATES OF MORTALITY OF *NEMATOPALAEEMON TENUIPES*  
(HENDERSON) IN THE BOMBAY WATERS

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ABSTRACT

The fishery of *Nematopalaemon tenuipes* showed wide fluctuations. However, no downward trend in the catch or c.p.u.e. is indicated. The estimated annual total mortality rate in males and females is found to be 3.68 and 2.98 at Versova while it is 3.64 and 3.11 at Sassoon Docks.

*Nematopalaemon tenuipes*, belonging to the family Palaemonidae, is of commercial importance in the Maharashtra coast and accounts for about 33 % of the total prawn landings in the state. The fishery and biology of this prawn was studied by Shaikmahmud and Tembe (1960) and Kunju (1967, 1979) from Bombay; Rajyalakshmi (1966) and Rao (1966) from West Bengal and Subrahmanyam (1960) from Gadovary estuary. The present study conducted during 1969-75 forms a continuation of the earlier studies and highlights the fluctuations in the fishery and estimates of mortality of this prawn from Bombay.

*N. tenuipes* is caught throughout the year in stake nets, locally known as *dol*, except during the southwest monsoon period i.e., June-September, at Versova. However, fishing operations are continued on a minor scale during the above period also at Sassoon Docks. The mechanised boats operate the *dol* nets at Versova and trawl nets at Sassoon Docks in the depth range of 15-40 m. At Sassoon Docks, the non-mechanised boats operate *dol* nets in shallow waters (10-15 m. depth).

The estimated total annual catch of *N. tenuipes* varied from 156.4 tonnes to 512.7 tonnes at Versova. At Sassoon Docks, it varied from 180.3 tonnes to 488.0 tonnes (Table 1). The bulk of the catch was obtained during April-May at both the centres. *N. tenuipes* contributes to an average of about 24.2 % and 28.4% of the total prawn landings by *dol* nets at Versova and Sassoon Docks, respectively. The peak period of the fishery was observed in May, whereas the lean season was during November-December.

At Versova, the maximum (512.7 tonnes) and minimum (156.4 tonnes) catches were recorded during 1971-72 and 1973-74 when the effort showed

TABLE 1. Yearly catch of *N. tenuipes* in tonnes, c.p.u.e. in kg. and effort in boat days at Versova and Sassoon Docks.

	VERSOVA.			SASSOON DOCKS		
	catch	c.p.u.e.	effort	catch	c.p.u.e.	effort
1969-70	232.4	48.1	4286	180.3	10.6	17950
1970-71	442.7	54.8	8074	348.6	16.0	21839
1971-72	512.7	89.1	5749	448.0	27.7	17501
1972-73	492.5	77.1	6390	—		
1973-74	156.4	29.6	5280	—		
1974-75	231.9	44.0	5261	—		

little variation (5749 and 5280 boat days respectively). However, only a moderate catch of 442.7 tonnes was obtained during 1970-71 when the effort was the highest (8074 boat-days). Though the effort at Sassoon Docks was considerably higher than at Versova, the catches were comparatively poor (Table 1). From these observations it would seem that there is no correlation between the catches and the effort.

The instantaneous mortality rate 'Z' has been calculated between 7-12 months and 13 months and above, since prawns below 6 months are not fully representative. The age composition data (Sukumaran, unpublished) is further analysed for estimating the instantaneous mortality rate by employing the formula,

$$Z = \log e \frac{n_1}{n}$$

Where,  $n_1$  and  $n_2$  are numbers of prawns per unit of effort in the same fishing season in different age groups, i.e., 7-12 months and 13 months and above, respectively. (The number of prawns in each size group was estimated by using the sample weight and the estimated catch in weight on each observation day. Later, these data were raised to monthly catch weight. The number of prawns during different seasons was obtained by pooling the data from September to August which is taken as a fishing season in the present study). It is seen that 'Z' varied from year to year (Table 2). The instantaneous mortality rate for males and females is 3.68 and 2.98 at Versova and 3.64 and 3.11 at Sassoon Docks respectively.

TABLE.2 *Estimates of mortality rates of N. tenuipes at Versova and Sassoon Docks from 1969-70 to 1974-75.*

		1-6 months (up to 40 mm) (n <sub>0</sub> )	7-12 months (41-58 mm) (n <sub>1</sub> )	13 months and above (above 58 mm) (n <sub>2</sub> )	$\log_e e \frac{n_1}{n_2}$
<b>MALE</b>					
<b>VERSOVA</b>	1970-70	35678	62855	548	4.74
	1971-72	50535	172264	609	5.64
	1972-73	177876	141070	854	5.11
	1973-74	3307	41655	2220	2.93
	1974-75	94776	116560	—	—
	Average				3.68
<b>S. DOCKS</b>	1969-70	1416	44676	4574	2.78
	1970-71	14634	51205	1549	3.50
	1971-72	58194	61074	357	5.14
	Average				3.64
<b>FEMALE</b>					
		(up to 46 mm) (n <sub>0</sub> )	(47-64 mm) (n <sub>1</sub> )	above 64 mm) (n <sub>2</sub> )	
<b>VERSOVA</b>	1970-71	59230	112395	2459	3.82
	1971-72	160931	113276	3463	3.49
	1972-73	220539	136380	2006	4.22
	1973-74	8766	91730	3452	3.28
	1974-75	70134	141033	—	—
	Average				2.98
<b>S. DOCKS</b>	1969-70	2464	14348	2612	1.70
	1970-71	21432	56071	1163	3.87
	1971-72	67273	35257	832	3.75
	Average				3.11

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