

DISTRIBUTION AND SWARMING OF MYSIDS IN THE NEARSHORE WATERS OFF BOMBAY

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ABSTRACT

Distribution and abundance of mysids were studied in the nearshore waters off Bombay along three transects located off Versova, off Mahim and Thana creek covering 11 stations during November 1979 to December 1980. Maximum population of mysids was recorded during the premonsoon period. Density of mysids was more in Versova than at Mahim and Thana transects. Tidal variation and pollution load influenced the distribution of mysids. Swarming of *Mesopodopsis zeylanica* was observed in Versova creek during April 1980.

INTRODUCTION

In the shallow inshore regions of the tropics mysids are fairly abundant and many species are tychopelagic. Mysids are of relatively large size for zooplankton and hence may form a link in the marine food chain from particulate matter to macroplankton (Raymont, 1983). They also form a constituent of the diet of several fishes particularly in shallow waters. Considering this importance of mysids to the fishery, detailed study on the group was taken up to evaluate their incidence in the creek and nearshore waters of Bombay. A few reports on the zooplankton from the nearshore waters give some information on their occurrence in the area (Bhattacharya & Kewalramani 1972; Mhasawade & Gore 1975; Gajbhiye & Desai 1981; Gajbhiye 1979, 1982; Desai, Gajbhiye & Ram 1981). Effect of pollution on the distribution of mysids also forms part of this study.

MATERIALS AND METHODS

Samples were collected from November 1979 to December 1980 from 11 stations located off Versova, off Mahim and in the Thana creek (Fig.). The creek stations of Versova (200 mld) and Mahim (350 mld) received large amount of sewage whereas Thana creek is affected by discharge of industrial effluents.

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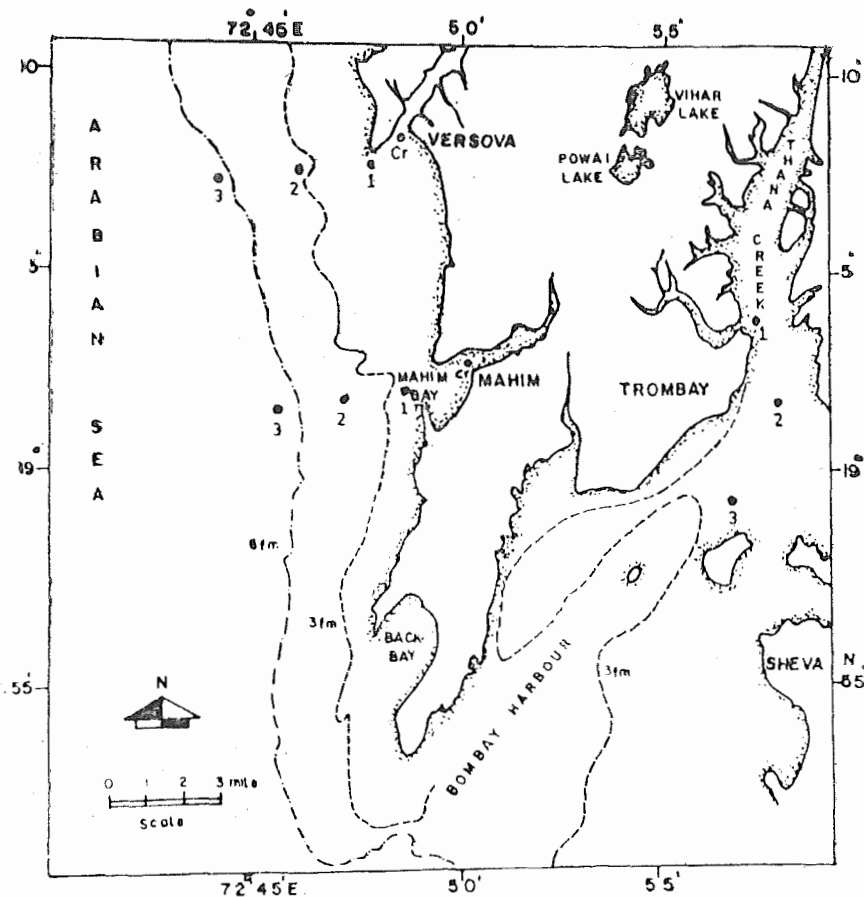


Fig. : Location of Stations

Zooplankton samples were collected using an H.T net (0.25 m^2 mouth area; mesh size 0.3 mm) fitted with a TSK flow meter. Mysids from the collections were sorted out and the density was calculated in terms of $\text{no}/100 \text{ m}^3$. Water samples for the estimation of salinity, DO and nutrients were collected and analysed as per standard procedures.

RESULTS & DISCUSSION

Physico-chemical parameters

A detailed account on the physico-chemical parameter at the different area of study had been reported by Nair *et al.* (1983). Salinity varied from 1.74 to 37.07‰ during the period of study with low values confined to the monsoon period. Dissolved oxygen fluctuated from 0.0 — 8.72 mg/l. Zero values of DO were usually obtained from the creek stations particularly during low tide. Very high values of phosphate ($60.86 \mu\text{g. at/l}$) and nitrate ($85.18 \mu\text{g. at/l}$) were recorded from the polluted creek stations. The deteriorating conditions observed at the creek station gradually decreased towards offshore stations of each transect suggesting the improved water quality towards offshore area (Gajbhiye, 1982).

Mysid population

Mysids were often recorded in the zooplankton samples with peak in April/May. Average density of mysids in relation to total zooplankton was 7.78, 0.17 and 0.08% respectively at Versova, Mahim and Thana transects.

Versova transect :

The percentage composition of mysids to the total zooplankton population varied from 0.0 to 99.86%. The frequency of occurrence at stations creek, 1, 2 and 3 were 61.54, 57.69, 34.61 and 30.77% respectively. Unusual abundance of mysids amounting to 102514/100m³ was recorded at the creek station during flood tide in April 1980. There is gradual decrease in mysid population from the creek towards the offshore stations (Table). Their average density during flood tide at stations creek, 1, 2 and 3 were 9279, 142, 46 and 15/100 m³ respectively. During ebb tide their mean density at the above stations were 331, 4404, 1206 and 63/100 m³ respectively. The samples were dominated by *Mesopodopsis zeylanica* with occasional incidence of *Siriella* sp.

Mahim Transect

The range in the percentage composition of mysids to total zooplankton was 0.0 — 5.99% irrespective of tide. The frequency of occurrence at stations creek, 1, 2 and 3 were 3.85, 23.08, 19.23, 15.37% respectively. The population peak of mysids was observed in May at st. 1 (3900/100 m³) during ebb tide (Table). The average population density during flood tide at stations creek, 1, 2 and 3 were 10, 9, 3 and 0/100 m³ respectively. The corresponding values during ebb tide for these four stations were 0, 308, 84 and 31/100 m³. *Mesopodopsis zeylanica* was the dominant species. *Siriella* sp. was occasionally encountered in the collections.

Thana Transect

Numerical counts of mysids were low in the Thana creek. Population maximum was not well defined as in the other two transects. Highest number (1450/100 m³) was recorded at station 2 during ebb tide (Table). The frequency of occurrence was 21.43, 25.0 and 32.14% respectively at stations 1, 2 and 3 irrespective of tide. They contributed 0.0 to 0.75% of total zooplankton. Mysids were represented by *Rhopalophthalmus macropsis* and *Acanthomysis platycauda*.

Representation of mysid was more at Versova than in the other two transects. Mean density of mysids at Versova, Mahim and Thana were respectively 1936, 56 and 21/100 m³. At Versova mysids closely followed the distribution pattern of total zooplankton with steady increase in population from offshore towards the near shore regions during flood tide and a reverse pattern during the ebb tide (Gajbhiye, 1982). In general, high population of mysids observed during flood tide at Versova creek decreased appreciably during ebb tide. This appears to be due to the adverse effects of sewage discharge which is more during low tide when the dissolved oxygen values came down to almost zero values. The improved water quality at stations 1-3 probably accounted for their occasional high abundance during ebb period. Their ab-

Table : Monthly variation of Mysids (no/100 m³) during (Fl) & ebb tide at Versova, Mahim & Thana transects

Month	VERSOVA								MAHIM								THANA					
	Creek		St. 1		St. 2		St. 3		Creek		St. 1		St. 2		St. 3		St. 1		St. 2		St. 3	
	Fl.	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb	Fl	Ebb
Nov 79	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	5	10	4
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Jan 80	-	53	-	-	28	29	19	10	-	-	-	-	10	-	-	-	-	-	-	-	-	-
Feb	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5	-	-	-
Mar	13653	5	367	2	10	-	-	-	-	-	-	16	-	-	-	1	-	41	-	1450	-	-
Apr	102514	52	1100	57227	-	14700	-	45	-	-	-	-	-	-	-	-	-	-	3	-	2	3
May	91	4160	20	2	-	929	-	-	128	-	97	3900	28	1067	-	376	-	-	10	-	-	-
Jun*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	37	3
Jul	14	10	5	2	4	2	169	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug	3	-	9	4	-	-	-	-	-	-	-	-	-	-	-	-	5	11	-	10	91	-
Sept	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oct	320	11	21	21	-	21	3	621	-	-	-	21	-	31	-	4	-	-	-	23	-	-
Nov	4032	6	310	-	560	-	-	-	-	-	21	69	-	-	-	20	1	-	-	-	-	6
Dec	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*No samples for Versova & Mahim

sence in the Mahim creek except for a single record is also noteworthy. The general pattern of distribution of mysids indicates their preference to Versova transect.

The records of all the 4 species of mysids are new to the nearshore waters of Bombay. Eventhough *Mesopodopsis orientalis* was recorded from Bombay waters (Bhattacharya & Kewalramani, 1972) the species was not found in the present collections.

Swarming of mysids was observed along the Versova transect at creek, st. 1 and st. 2 during April 1980. This unusual congregation of mysids was contributed by a single species, *Mesopodopsis zeylanica*. It is interesting to note that during the same month their population at Mahim transect was nil and during May the population spread over to Mahim stations 1 & 2. Second peak in mysid population was observed only at Versova during October-November, 1980.

Percentage composition of mysids during their swarming at Versova creek in April (flood) was 99.86% of total population with the biomass amounting to 114 ml/100 m³. The swarm of *M. zeylanica* was represented by 92% larval stages, 5.5% females and 2.5% males. Decapod was the only other group found in the sample. At St. 1 of Versova during the same period mysids contributed 87% of the total zooplankton.

Swarming of mysids in the nearshore waters of Bombay has never been recorded earlier. Off Maharashtra, Nair (1977) reported on the unusual aggregation of the crustacean *Acetes johni* during the premonsoon period. Swarming in mysids is a well marked behaviour (Raymont, 1983) and may be attributed to spawning, maturation, predation, light intensity etc. It appears to be a complex behavioural pattern. Such unusual congregation of mysids and their importance as a constituent of the diet of fishes in shallow water call for further intensive study on the group.

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