

ZOOPLANKTON PRODUCTION IN COASTAL WATERS

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INTRODUCTION

A review of the earlier works on zooplankton of Andaman and Nicobar waters indicates paucity of information. Tsuruta (1963) discussed the representative composition and the distribution of plankton of the fish grounds for tuna in the Bay of Bengal based on samples collected in the deeper waters off these islands. Chiba (1956) and Jones (1966) have given accounts on systematic studies of copepods. Pillai (1970) and Roy (1977) described the occurrence of new species of calanoid copepods in the coastal waters of Andaman Sea. Rangarajan and Marichamy (1972) made a brief mention on the seasonal fluctuations in the biomass of plankton. Recently, Paulinose and George (1976) have recorded the occurrence of larvae of penaeid prawns in large numbers in the waters around Andaman and Nicobar Islands. No published account is available on the seasonal distribution of zooplankton from the coastal regions of these islands. The present account is an effort to provide preliminary information on zooplankton and a general treatment of the distribution of planktonic larvae along the coast.

MATERIAL AND METHODS

Thirty-six zooplankton samples were collected from the surface waters of different areas of survey. The data were pooled for each prominent centre. In Mayabunder, Middle channel, North Point and Kalighat were covered. Since there was no significant differences in the composition and distribution of zooplankton from the samples collected around Sir William Peel, John Lawrence, Outram, Henry Lawrence, and Havelock islands the data were pooled and represented from station Havelock. In Little Andaman, samples were collected from two centres, namely Hut Bay and Butler Bay. At Port Blair, the centres of observation included Ross Island, North Bay, Chiriyatapu, Navy Bay, Corbyn's Cove and Janglightat. In Nicobar group, only nine samples were taken from different

islands. All the samples were collected around 0800 hours using a standard net of 0.5 m diameter and 0.4 mm mesh size, from the surface water and preserved in 5% formalin. The speed of the vessel was maintained at 1 knot during the five minutes collection time. The plankton biomass was determined by displacement method.

RESULTS

Zooplankton biomass

The displacement volume of the plankton varied between 1.4 ml and 40 ml per sample (Fig. 1). The

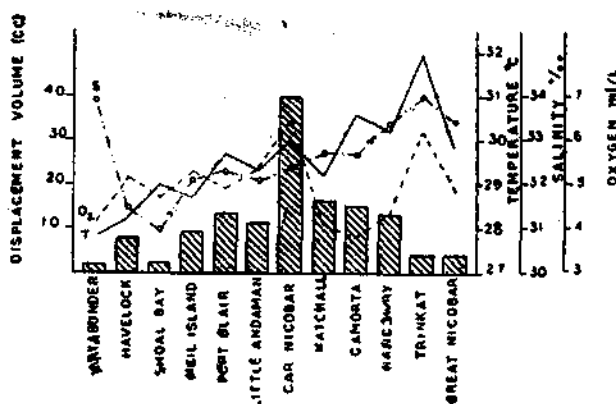


Fig. 1. Zooplankton displacement volume in relation to environmental parameters at the major centres of observation.

lowest volume was recorded from Mayabunder. Since the period of observation was very limited the influence of seasonal changes in temperature, salinity or oxygen on the biomass cannot be established. It has generally been noticed that the volume of plankton was low in places where the salinity values were relatively high and the temperature was very high or very low (Fig. 1).

Faunistic composition

The relative abundance of zooplankters is depicted in Fig. 2 for each island covered. The prominent groups in the area of study were copepods molluscan larvae, chaetognaths, decapod larvae, lucifer and

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appendicularians. The faunistic composition was different from place to place. Appendicularians were rich (31.8%) in the collections made at Mayabunder, but occurred in negligible proportions in other centres. Salps, included under 'others' in the figure, appeared

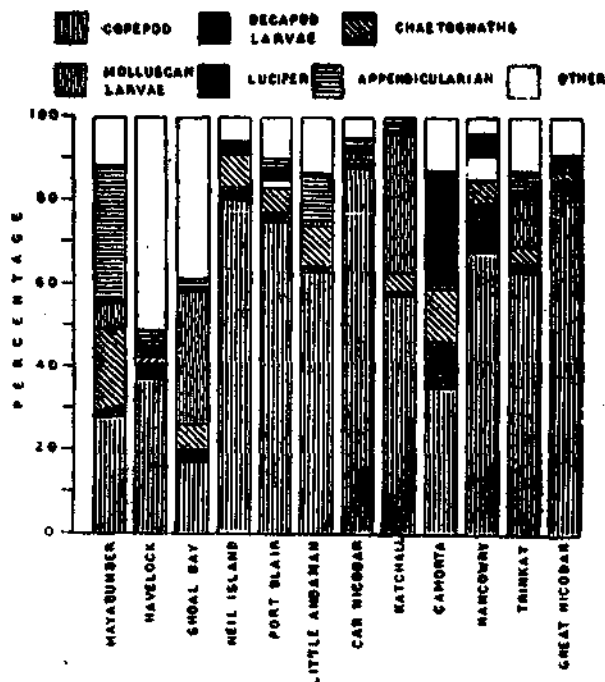


Fig. 2. Percentage of important zooplankton groups in Andaman and Nicobar Islands during February-April 1978.

equal to copepods from Havelock area, but were altogether absent in other collections. Pteropods (also included under 'others') were fairly common in Shoal Bay (19.4%) but rare from other areas. Similarly, lucifers were predominant (52.8%) from the collections of Camorta, but formed only 4.10% in other nearby islands of Nancowry and Katchall, and were absent in other localities. Gastropod larvae were significantly rich in Nicobar Islands.

Copepods were the most important constituent of the zooplankton community. They were exclusively rich (80-87%) in Neill Island, Car Nicobar and Great Nicobar. Chaetognaths were next in importance and better noticed from Mayabunder, Port Blair and Camorta. The other constituents include siphonophores, amphipods, *Doliolum*, polychaete larvae and foraminifers and they were noticed from all collections but in negligible ratios.

Distribution of eggs and larvae

A wide variety of larvae in varying intensities was seen from many centres of the coastal waters of these

islands. Fish eggs were present in the collections made at all centres. They accounted for 6.6% in total collections in Havelock area, 3.5% from Port Blair and 3.7% in Car Nicobar. Fish larvae occurred in good numbers (5.5%) around Havelock. Molluscan larvae, chiefly of gastropods, occurred in high percentage from Katchall Island and Shoal bay, but was relatively scanty in the rest of the places. The percentage of lamellibranch larvae varied from 0.1 to 2.9%. The decapod larvae constituted a maximum of 12% from Nancowry samples and varied considerably in other centres.

The data on eggs and larvae from all observation centres were pooled and the percentage composition of the groups was worked out. The gastropod larvae ranked first (74.8%) among the larval forms. Lamellibranch larvae were less (2.3%) and polychaete larvae formed 1.4%. The decapod larvae accounted for 12.6% including a variety of forms and developmental stages. Larvae of penaeids appeared to be more common. Zoea were next to them. Phyllosoma larvae were 12 to 16 number in each sample collected during first week of April 1978 from Great Nicobar and Nancowry. Fish eggs (7.9%) and larvae (1.0%) were present in moderate numbers and constituted nearly 9% of the total larval forms. The total larval forms were generally high in the Nicobar group of Islands.

REMARKS

Prasad (1966) observed a moderately high plankton production in Andaman Sea. Rangarajan and Marichamy (1972) stated that the plankton production at Port Blair was high during the colder months and low during the period of high temperature and high salinity. Tsuruta (1963) remarked that waters west of Nicobar Islands were the richest in quantity of plankton, but the waters west of the Andaman Islands were the poorest in quantity during December 1957 to January 1958 in the layer at depth of 100 m. In the present study it is seen that copepods were the most abundant group. The percentage composition of the planktonic larval populations has shown that gastropods and decapods constitute the most important groups. Gastropods account for nearly 75% of all larvae. The breeding season of this group should be the summer. Menon *et al.* (1967) and Paulinose and George (1976) observed high concentration of decapod larvae nearer the shore. The decapod larvae were prominent in the coastal waters around Nicobar Islands and these may be considered as areas of higher concentrations of spawning stock and their larval forms. The availability of fish

and shellfish larvae may be taken as an indication of the presence of cultivable stock. From this aspect, the Spiteful Bay of Nancowry, Hog Point of Car Nicobar,

coastal areas in Katchall, Port Blair and Shoal Bay stand as potential areas for the development of mariculture.

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