

ZOOPLANKTON FROM THE SHELF WATERS OFF THE WEST COAST OF INDIA

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ABSTRACT

Zooplankton in the shelf waters of India from Dabhol to Tuticorin was studied during the 17th cruise of R. V. *Gaveshani* in March 1977. Biomass values were relatively high in the central zone between Mangalore and Alleppey. In the region between Trivandrum and Tuticorin low biomass values were observed. Major groups like copepods and chaetognaths had a high density in the central and northern zones. However, fish eggs and larvae and decapods maintained high abundance between Trivandrum and Tuticorin.

The shelf waters of the west coast of India are very productive and sustain a rich and abundant planktonic life. The region is of much significance to the country because of its rich fishery.

The cruise of R. V. *Gaveshani* was planned to make a survey of the western continental shelf between Dabhol and Tuticorin. Purushan, Balachandran and Sakthivel (1974) reported the different groups of zooplankton from the shelf and coastal waters off the Kerala coast and based on their collections, detailed studies on the individual groups like ostracods (George, Purushan and Madhupratap, 1975), chaetognaths (Nair, 1977) and hydromedusae (Santhakumari, 1977) were carried out.

Some observations on the zooplankton from the southwest coast of India were made by the Pelagic Fishery Project, Cochin (Anon. 1974, 1976; Devadas and George, 1977). Peter, Iyer, John and Radhakrishnan (1977) studied the distribution and coexistence of zooplankton organisms based on the collections from west coast of India made by the Pelagic Fishery Project. However, none of these studies have covered the entire shelf region and hence the present study was undertaken to supplement the existing knowledge on zooplankton from the shelf waters.

The cruise started on 23.3.1977 and ended on 1.4.1977. Zooplankton sampling was made from 47 stations exclusively within 50 m depth. The location of the various stations is shown in Fig. 1. Of the 47 stations, 41 were located in the Arabian Sea and six in the Gulf of Mannar. From most of the stations two sets of collections were made using a Heron-Tranter (HT) net (mouth area .25 m² and mesh size 0.3 mm) equipped with a flow meter. One haul of 6 minutes duration was at the surface and the other, vertical haul from 50 m (maximum) and 10 m (minimum) to the surface depending on the depth of the station. In all, seventy samples were collected which were analysed for biomass (displacement method) and for quantitative enumeration of major groups like copepods, chaetognaths, decapod larvae, fish eggs and fish larvae. Estimated abundance for the different groups was expressed as no./m³. For the preparation of distribution charts for the different groups, only the vertical hauls were

taken into account. For a comparative evaluation of the data the region under investigation was divided into three zones: northern zone between the latitude 14°N to 18°N , central zone between 10°N to 14°N and the southern zone between 8°N to 10°N .

Biomass: The shelf waters were fairly rich in biomass (Fig. 2). The central zone particularly between Mangalore and Alleppey was richer in zooplankton. Maximum biomass of $1.05/\text{m}^3$ was recorded from the station off Vengurla (Station 8).

Copepoda: Copepods dominated in all the samples excluding those from station 1 (Fig. 3). High values occurred throughout the area with a maximum density of $22,000/\text{m}^3$ from the station 6. Low values were recorded between Bhatkal and Mangalore.

Chaetognatha: Chaetognaths were fairly abundant in the collections and were dominant at station 1 (Fig. 4). Highest density of $11,000/\text{m}^3$ was recorded from the station 6. Almost uniform values were obtained between Quilon and Tuticorin. Maximum values were confined mainly in the central and northern parts of the region surveyed.

Decapod larvae: Larvae of decapods were obtained from all the stations (Fig. 5) but their occurrence was greater in the region between Calicut and Tuticorin.

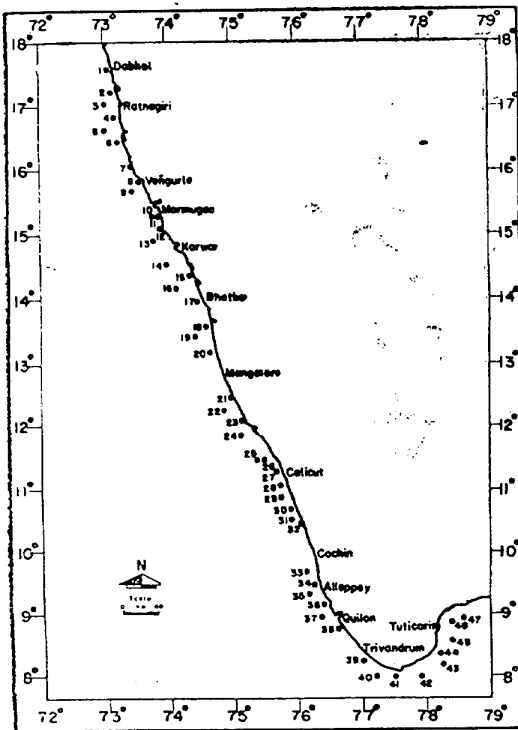


Fig. 1. Location of stations covered during the 17th cruise of R. V. Gaveshani.

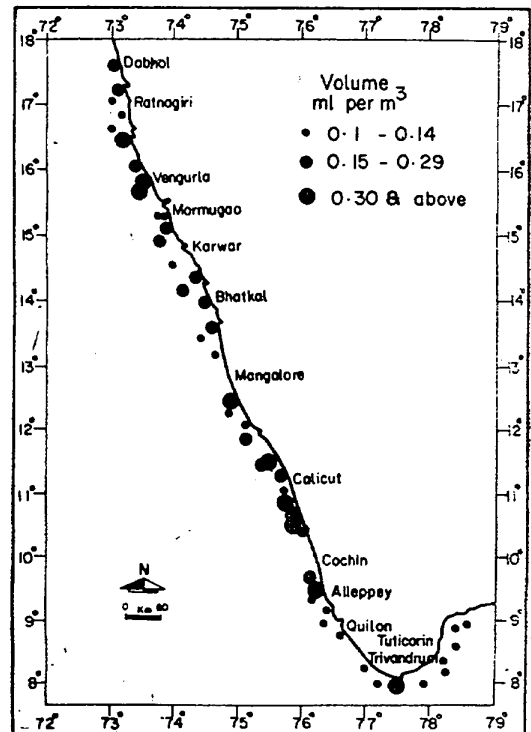


Fig. 2. Distribution of biomass in the shelf waters.

Unusual congregation of these larvae ($120,000/m^3$) was recorded at the station 30. Density of these larvae was relatively low towards the central and northern zones.

Fish eggs: Fish eggs were not common in the samples and were present only in 23% of the samples. The maximum number of $83/m^3$ was obtained from the station 47 (Fig. 6). The southernmost part of the surveyed region sustained maximum abundance.

Fish larvae: Fish larvae were recorded in approximately 62% of the collections. Maximum abundance of the larvae was between Cochin and Calicut. The highest value of $1100/m^3$ was confined to the station 44 (Fig. 6).

The hydrography of this area has been studied earlier by Darbyshire, Banse and Anon, in the years 1967, 68 and 76 respectively. Seasonal changes in the overall oceanographic conditions of the area appear to be similar from year to year and the most important process for fisheries is the upwelling which starts in March and continues during the southwest monsoon with its maximum effect in August/September (Anon, 1976). The period of the present observation (March) coincides with the onset of upwelling. During this period the abundance of zooplankton was high in the shelf waters, particularly between Mangalore and Alleppey. Primary production was also

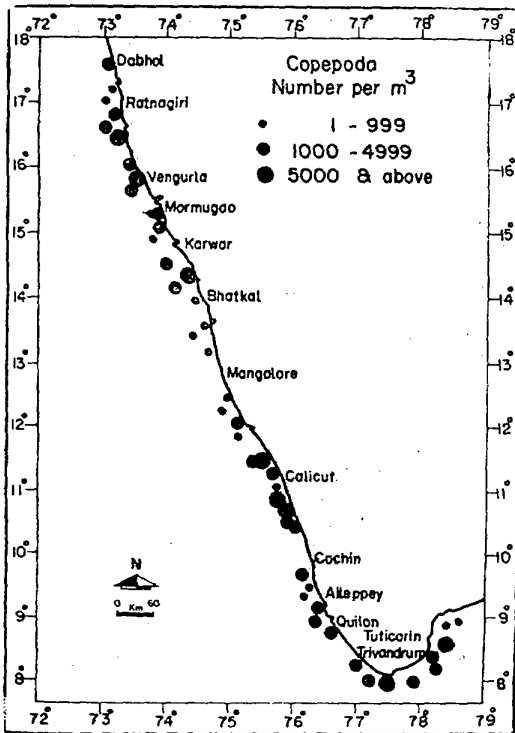


Fig. 3. Distribution of Copepoda in the shelf waters.

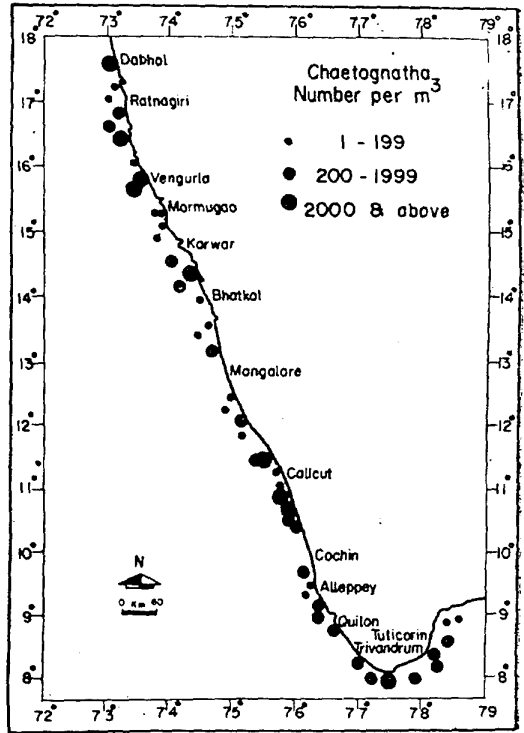


Fig. 4. Distribution of Chaetognatha in the shelf waters.

recorded to be high between Karwar and Calicut (Qasim, Wafar, Sumitra-Vijayaraghavan, Royan and Krishna Kumari, 1978).

Menon and George (1977) recorded low biomass in the shelf waters from January-April and pockets of medium biomass of zooplankton at the shelf edge off Cochin and off Ratnagiri (Anon, 1974). But in the present observation production off Ratnagiri was low although pockets of high production south of Ratnagiri were common. Relatively higher production was observed towards the middle of the region probably due to intensity of upwelling influencing the biological cycle.

The shelf waters sustained high abundance of fish eggs at localised areas particularly between Trivandrum and Tuticorin. The location of large congregation of eggs could very well provide an evidence of fish spawning in the area. Incidence of fish larvae was also high in this region. The area was also rich in decapod larvae.

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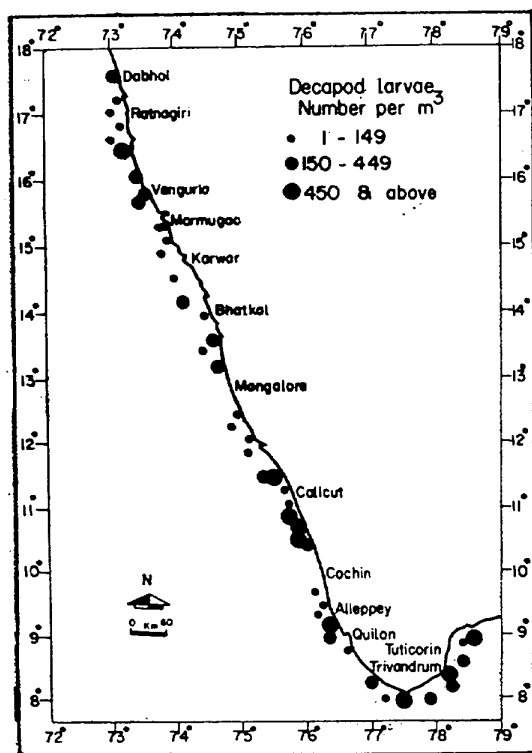


Fig. 5. Distribution of Decapod larvae in the shelf waters.

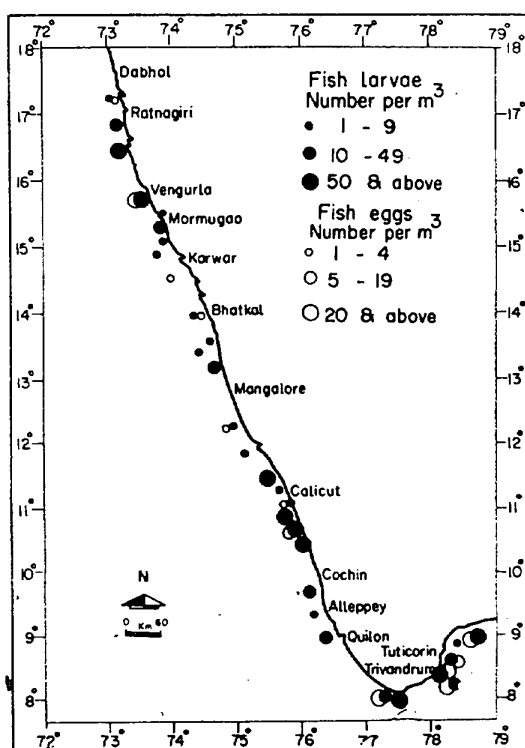


Fig. 6. Distribution of fish eggs and larvae in the shelf waters.

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