

**ZOOPLANKTON STUDIES IN THE SOUTH WEST COAST OF INDIA**

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**Abstract:** Zooplankton sampling was carried out along Lat. 9°10'N to 10°22'N and Long. 75°08'E to 75°48'E. Sampling was also at 6 hour interval from 10 m and 50 m to surface from a station at Lat. 9°47.6'N and Long. 75°44.8'E. The biomass varied between 6.0 and 51.0 ml/100 m<sup>3</sup> at enroute stations and 0.3 and 43.0 ml/100 m<sup>3</sup> for the time series collections. Thirty five groups are represented in the plankton collections. Copepod is found to be the dominant group followed by chaetognath, copepate, decapod and gastropod. Bivalves are scanty. Fish eggs and larvae have been found in considerable numbers. While biomass and the numerical abundance were found to be more from 10 m to surface the faunal composition was higher from 50 m to surface. Simultaneously certain hydrographic parameters were also collected.

**1. Introduction**

Distribution and biomass of the zooplankton of the south west coast of India (Lat. 9°10'N to 10°22'N and Long. 75°08'E to 75°48'E) was studied in the 196th Cruise of R.V. Gaveshani in May 1988.

**2. Materials and Methods**

The cruise track and station location are shown in Fig. 1. Vertical zooplankton samples were taken from 10 - 0 m enroute stations and also 50 - 0 m from anchor station at 6 hour interval (morning, noon, evening and midnight) using Heron Tranter (HT) net attached with a flow meter and preserved in 5% formaldehyde. Zooplankton groups representing more than 2% were shown separately and others were pooled together and represented in distribution chart (Fig.3).

**3. Results and Discussion**

There was not much change in the hydrographic parameters like temperature, salinity and oxygen during the days of observation (Table I).

Table 1. Range of hydrographic parameters.

	Temp (°C)	Salinity (%)	Diss. Oxygen (ml/l)
Enroute Stations	30.0 - 30.8	32.25 - 35.50	5.71 - 9.63
Anchor Station	28.6 - 31.3	34.96 - 36.58	5.39 - 7.51

During the present investigation one station in the inshore of Lat. 10°22'N and Long. 75°56'E showed biomass values of 44 ml/100 m<sup>3</sup> and an offshore station at Lat. 9°10'N and Long. 75°19'E had 51 ml/100 m<sup>3</sup>. It is noticed that during the period of study the production was found to be more in the nearshore area. Eventhough highest biomass is observed in one of the offshore stations the components of the sample contained only 8 groups and the highest biomass may be due to the presence of organisms such as salps, doliolids and chaetognaths which retain more water content in the body. In the anchor station collections, the maximum biomass of 43 ml/100 m<sup>3</sup> was observed in the 10 - 0 m collection and 34 ml/100 m<sup>3</sup> in 50 - 0 m. Further, much difference was noticed in the biomass value during the time of observation viz. morning, noon, evening and midnight in both 10 - 0 m and 50

- 0 m collections. The maximum average biomass value 25.20 ml/100 m<sup>3</sup> was observed during evening hours and the next high value of 15 ml/100 m<sup>3</sup> was at midnight collections from a depth of 10 - 0 m. When the biomass data collected from 10 - 0 m is pooled together and the maximum value calculated the evening collec-

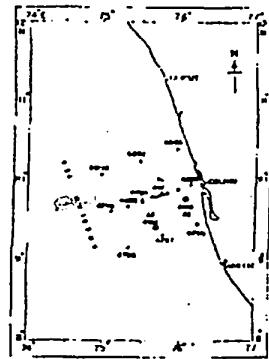


Fig. 1

Fig. 1. Map showing the sampling stations along the cruise track.

tions showed approximately double the value than that of the day collections corroborating the above findings. The 50 - 0 m collections did not show much variation (Fig. 2). Nair et al (1978) have observed biomass of 1-9 ml/100 m<sup>3</sup> in the postmonsoon period in most of the stations of Cochin whereas in the present study the range 1-9 ml/100 m<sup>3</sup> was observed in the offshore area and more.

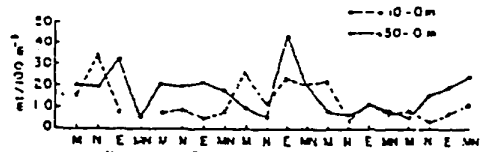


Fig. 2

Fig. 2. Diurnal variation of zooplankton biomass. M - MORNING; N - NOON; E - EVENING; MN - MIDNIGHT 11 - 15 denotes the dates of sampling.

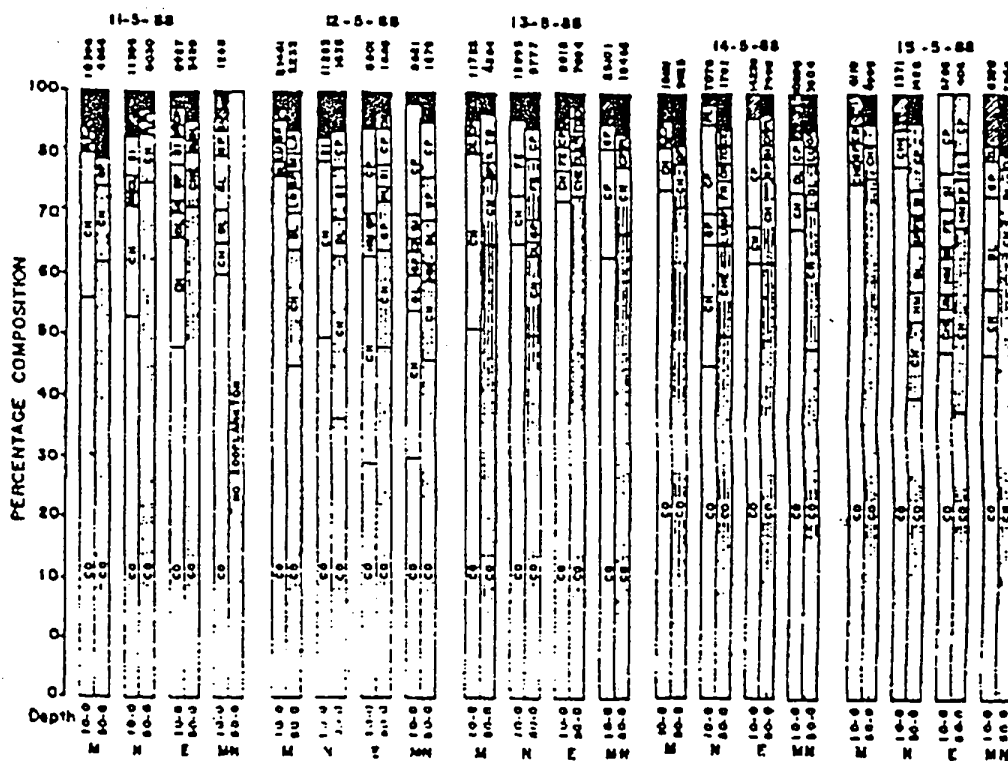


Fig. 3

Fig. 3. Zooplankton/100 m<sup>3</sup> Percentage composition and total number.

M - MORNING; N - NOON; E - EVENING; MN - MIDNIGHT AM - Amphipoda  
 BL - Bivalve larvae HM - Hydromedusa CP - Copepoda  
 CL - Cladocera LU - Lucifer CO - Copepoda LA - Lamellibranch  
 CH - Chaetognatha PC - Polychaeta CR - Cressis OS - Ostracode  
 DL - Decapod larva SD - Salps Dolifolids EU - Euphausiid SI - Siphonophora  
 FE - Fish Egg ZL - Zoea larva FR - Foraminifera TO - Tomaria

□ □ - Groups with 2% occurrence

biomass was observed in the coastal waters. This indicates that high production of zooplankton is noticed in the present study towards the end of premonsoon period (May) compared to postmonsoon period.

Out of 34 groups represented in the whole zooplankton samples during the observation only 31 groups were observed in the enroute collections. It is also observed that the faunal composition was higher in the 50 - 0 m collections than the 10 - 0 m.

Copepods formed the dominant component of zooplankton forming 57.44% of the total counts collected from the enroute stations. They were fairly uniformly distributed at all the stations. Highest numbers 8182/100 m<sup>3</sup> were recorded at Station 4807. The copepods were found more in 10 - 0 m collection at the anchor station excepting in the mid-night of 15th where 50 - 0 m showed an abundance of 5537/100 m<sup>3</sup>. The highest number 18393/100 m<sup>3</sup> was recorded at 10 - 0 m.

Chaetognaths formed the next largest group in abundance. The highest recorded value was 4128/100 m<sup>3</sup> at Station 4798. In the anchor station collections also chaetognaths were found to be second in numerical abundance. This group had better representation in all the samples. Highest recorded value was 3403/100 m<sup>3</sup> taken from 10 - 0 m on 13th morning. Fish eggs were observed throughout the sampling area except in one station whereas fish larvae were absent in two enroute stations. In the anchor station fish eggs were abundant in the 10 - 0 m collections and the maximum numbers 1807/100 m<sup>3</sup> was noticed on 13th noon. Fish larvae were also observed more in the 10 - 0 m samples and they were recorded mostly during midnight and morning collections. Siphonophores were found in all the stations except in two stations along the cruise track. The maximum numerical value obtained was 911/100 m<sup>3</sup> from Station 4801. The spatial abundance of decapod larvae indicated relatively low density in the samples collected along the cruise track, but at the anchor station they were

recorded in almost all collections except 10-0 m samplings of noon hours of 13th and 14th and in the evening hours of 15th in both the depths. Generally, decapod larvae also showed a numerical abundance in the 10-0 m collections rather than in 50-0 m with a maximum of 1264/100 m<sup>3</sup> on 15th midnight collection. The low density of decapod larvae in the enroute sampling area and the abundance of decapod larvae in the nearshore area off Cochin (anchor station) is in agreement with the findings of Nair *et al.* (1978) who have observed relatively low density of decapod larvae along the coastal region excepting off Cochin and Bombay. However, the south west coast of India is considered to be rich in decapod larvae (Menon and Paulinose, 1973). Eventhough gastropods were found only in three enroute stations, they were recorded in almost all collections in the anchor station except in the 10-0 m haul at morning hours on 11th and 14th, but the numerical abundance were found to be more in the 10-0 m collections with a maximum of 773/100 m<sup>3</sup> recorded in the morning hours of 12th. Copelates were found only in four enroute stations whereas they were represented in the anchor station collections in almost all samplings except from 50-0 m of 11th noon and midnight collections, from 10-0 m of 12th noon collections. In general, the copelates were abundant in the 10-0 m collections with a maximum of 3367/100 m<sup>3</sup>.

According to Subramanyam (1959) and Sudarshan (1964) the pelagic fishery show a direct relationship to zooplankton production. Therefore, high production of zooplankton in the coastal waters of Cochin indicating a high fishery potential in the area.

#### References

- Nair V R, Peter G and Paulinose V T 1978. Zooplankton studies in the Indian Ocean. II. From the Arabian Sea during the postmonsoon period. *Mahasagar - Bull. Natl. Inst. Oceanogr.*, 11 (1 & 2): 35-43.
- Menon P G and Paulinose V T 1973. Distribution of the decapod larvae in the Indian Ocean. *Handbook to the Internat. Zoopl. Coll., IOBC, Cochin, India*, 5: 163-171.
- Subramanyam R 1959. Studies on the Phytoplankton of the west coast of India. Parts I & II. *Proc. Indian Acad. Sci.*, 50: 115-252.
- Sudarshan D 1964. Observations on the plankton and trawler catches of Bombay. *Jour. Mar. biol. ass. India*, 6 (2): 222-225.