

LATITUDINAL DISTRIBUTION OF A FEW SPECIES OF PELAGIC POLYCHAETES IN THE UPPER 200 METERS WATER OF THE INDIAN OCEAN

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ABSTRACT

The latitudinal distribution of the three most abundant species of pelagic polychaetes in the Indian Ocean has been studied. For the purpose of this study hydrological features along the longitudinal lines of 50°E, 60°E, 70°E, 80°E, 90°E, 100°E and 110°E in relation to its pelagic polychaete population were examined. Variations in the number of specimens with latitudes in the different longitudes are represented in figures 1-3.

The changes in the hydrological conditions and the plankton population seem to be more pronounced in the north-south direction than in the east-west direction. It is particularly noticed that the northern tropical zone is conspicuous not only for its abundance of the number of specimens of each species but for the number of species also. The penetration of some of the cold water species into warm equatorial waters is another interesting feature.

INTRODUCTION

It is an accepted fact that the Indian Ocean is the least known among oceans in the world and this is particularly true with regard to its pelagic polychaete fauna. There may not be much change in the hydrological conditions and the plankton population in the east-west direction but in the north-south direction the change in these factors is more pronounced. This is particularly so in the Southern Indian Ocean. So it is worthwhile to have a study of the latitudinal distribution of atleast the more abundant species during an investigation of the zoogeography of a particular group. For the purpose of this study the hydrographical features of a number of stations distributed along the longitudinal lines of 50°E, 60°E, 70°E, 80°E, 90°E, 100°E, and 110°E in relation to their pelagic polychaete population were examined so as to study the variation in abundance in the different latitudes. Amongst a number of species of pelagic polychaetes occurring in large numbers in the collections only one species each belonging to the families Typhloscolecidae, Alciopidae, and Lopadorhynchidae have been taken for study in this connection.

Our knowledge on the distribution of pelagic polychaetes have greatly increased with the con-

tributions of Stop-Bowitz (1948), Dales (1957), Tebble (1960,1962) and Day (1967). But an approach to a large scale distributional study of them in the Indian Ocean has not been attempted so far. In the present contribution the results of an analysis of distributional variation in a north south direction represented by the different latitudes are reported.

MATERIAL

The present study is based on the pelagic polychaetes sorted out from the standard samples of plankton collected in vertical hauls using Indian Ocean Standard Net from a stratum of 200-0 m during the International Indian Ocean Expedition (1960-1965). The samples have been collected from various parts of the Indian Ocean during the different seasons of the year and different hours of day and night. As the samples from a number of north-south lines of stations have been used the data gives an overall picture about the latitudinal variation in abundance in the Indian Ocean. All the stations, where the concerned species has been collected, that occur along the particular longitudes have been taken into account. In the east-west direction the stations have been selected at approximately 10° intervals, giving a margin of 2 degrees to either side. The samples being collected during all the four years of the expedi-

tion at irregular intervals the conclusions drawn here are of course subject to inadequacies and although it does not give a concrete picture of the actual range of distribution, the overall pattern should be a fair representation of the latitudinal variation.

The samples are preserved in 5% formalin. The data are based on the computed values of 100% of samples as only a small fraction of each sample has been analysed. The complete list of station numbers with all the necessary details have been published in the IOBC Hand Book Volumes I and II (1969, 1972).

RESULTS

Figures 1, 2, and 3 show the variations in the number of specimens with latitudes in the differ-

ent longitudes. The averages of the total number of specimens collected from all stations occurring at every 5 degrees of latitude in the various longitudinal lines mentioned above are represented in the figures.

Pelagobia longicirrata

This species belong to the family Lopadorhynchidae and this is the most abundant species under this family. Figure 1 shows the latitudinal distribution of *Pelagobia longicirrata* along the different longitudes.

In the region of 50°E longitude *Pelagobia longicirrata* is found to be very rare and all of the recorded specimens from this region belong to the Equatorial area with its southern limit set at the

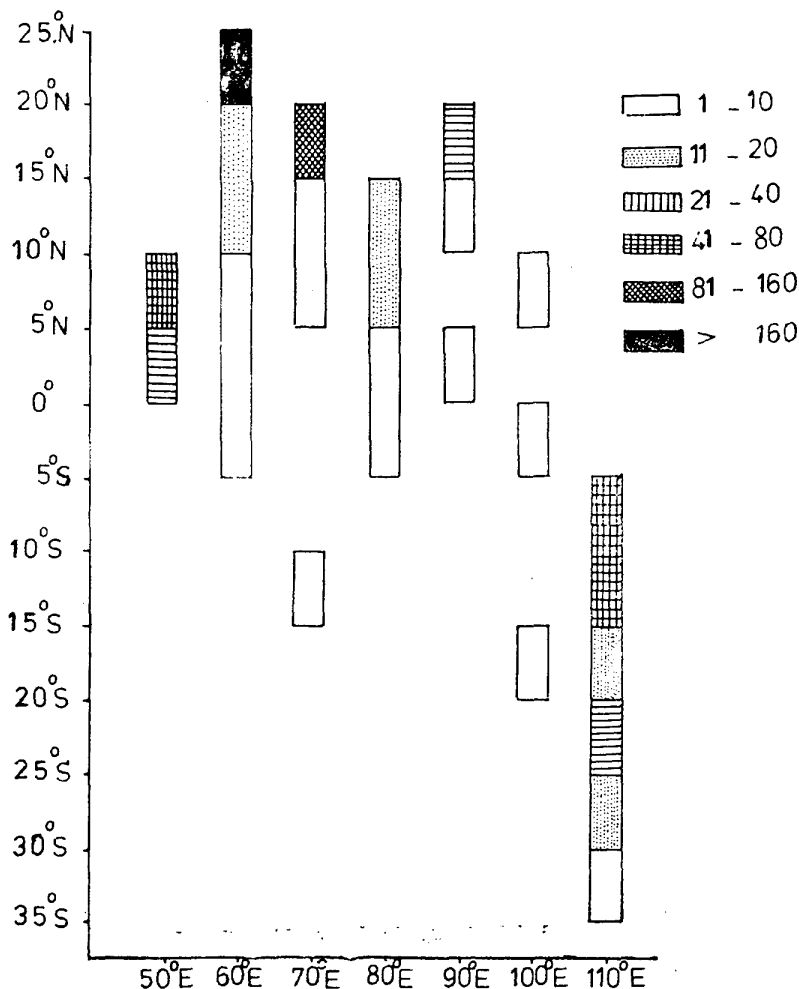


Fig. 1—Latitudinal distribution of *Pelagobia longicirrata*

Equator and northern boundary at 10°N. In the 60°E longitude it shows a further extension towards north and the maximum abundance of the species in the Indian Ocean is noticed in this region between 20°N and 25°N. This part of the Indian Ocean in general is very rich in zooplankton populations and this is reflected in the case of *P. longicirrata* too. They gradually decrease in their abundance along the line towards the south and become completely absent beyond 5°S. More or less the same pattern is noted in the next line of observation also (70°E), but the maximum abundance here is seen in 15°-20°N region. Towards the south they become rare and absent from 5°S downwards except for two specimens in 10°-15°S. From the figure it is clear that *Pelagobia longicirrata* is rare in the Bay of Bengal and the

recorded ones occur to the east of India and off the south coast of Indian continent, west of Ceylon. In general the southern parts of Indian Ocean is completely devoid of this species with the exception of the vicinity of Australian coast where it has been found in large numbers. The maximum number of this species in the southeast part of the ocean is found in 5°S-10°S at 110°E. From here they gradually diminish towards south disappearing below 35°S.

Two species belonging to the same family occurring in large numbers in the Indian Ocean, namely *Lopadorhynchus nationalis* and *Lopadorhynchus henseni* show almost similar type of latitudinal distribution. But they have a far more extension to the colder waters, being found upto 35° S

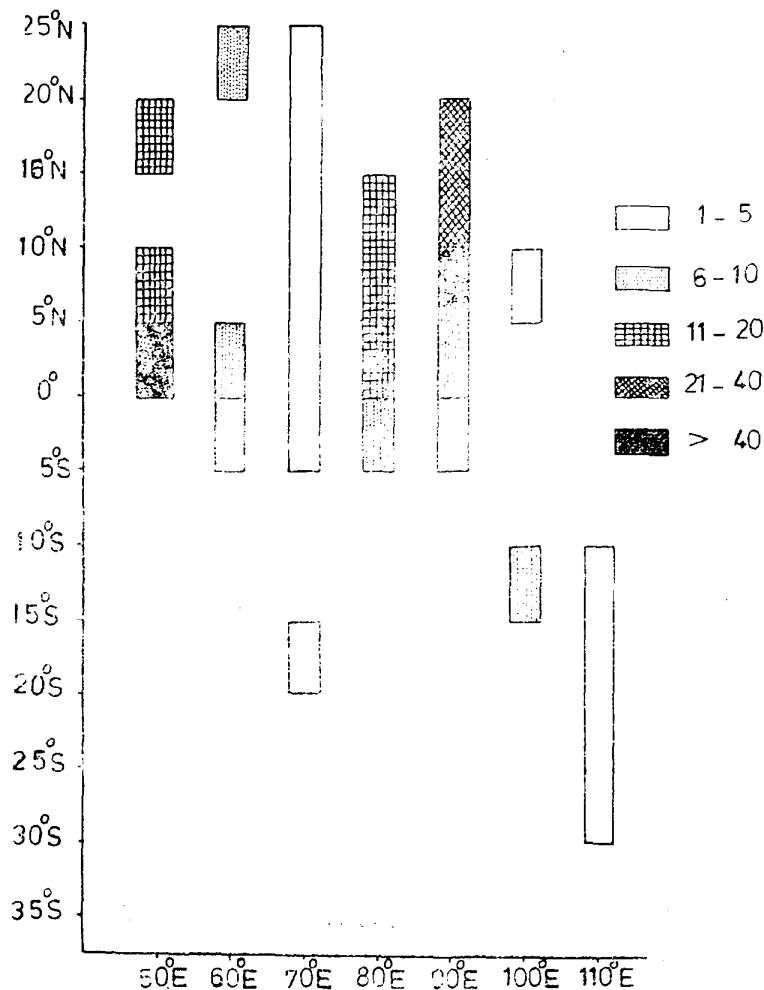


Fig. 2.—Latitudinal distribution of *Plotohelmis capitata*

in 70° E and 80° E longitude; though absent in the south west region of the ocean. *Phalacrophorus uniformis* is comparatively rarer than *Lopadorhynchus* spp. and the general pattern of latitudinal distribution is almost the same.

Plotohelms capitata

This species represents the most abundant group under the family Alciopidae. Though there is no well marked difference from the general pattern that is exhibited by the previous species, the rarity of the species in the southeast parts of the ocean is noteworthy (fig. 2). *Plotohelms capitata*, though collected from many stations in the Australian coast along 110° E, are found only

in small numbers unlike *Pelagobia longicirrata*. In the 50° E region this species occurs upto 20° N and in the 60° E its distribution is further extended upto 25°N, but they are absent between 5° and 20° N. A few have been collected from 5°N-5°S region, beyond which it is nil. The maximum abundance of this species in the Indian Ocean is found in the Equatorial region, but found to be very rare south of 5° S where it has been recorded only from one place in the 17° S. In the Bay of Bengal it is not rare though practically absent in 100° E longitude.

Another species under Alciopidae that occur in fairly large numbers in the Indian Ocean is

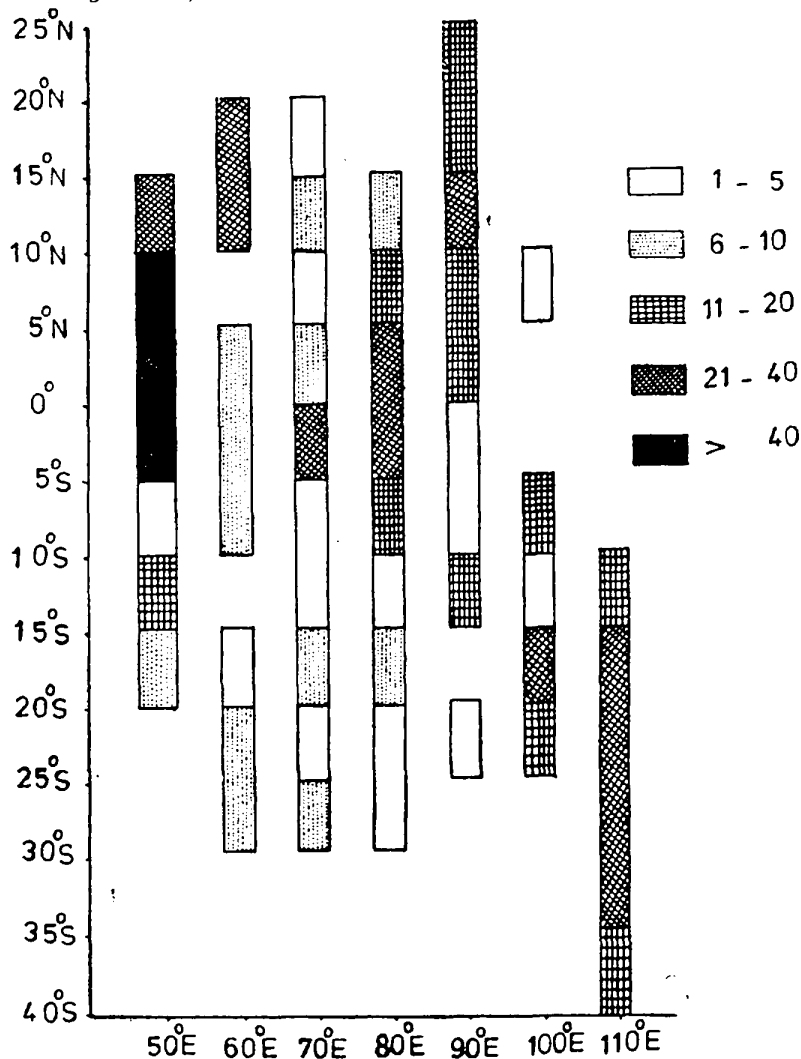


Fig. 3—Latitudinal distribution of *Sagitella kowalewskii*

Alciopina parasitica and this is found to have a wide distribution in the southern parts. Thus in the region of 60° E longitude they are found abundant in 10°-15° S region and also found to occur upto 30° S.

Sagitella kowalewskii

By far the most abundant group of pelagic polychaetes in the Indian Ocean belong to the family Typhloscolecidae, represented by all its three known genera of which *Sagitella* and *Typhloscolex* are more abundant. Latitudinal distribution of two species representing these genera have been studied and it is found that *Sagitella kowalewskii* represents the most widely distributed species in the Indian Ocean. From 50° E to 90°E it is found through out the ocean extending from 25° to 30°S. Its rarity is noticed only in the region south of Madagascar west of 50° E and the coasts of Sumatra and Jawa upto 10° S. In the Southeast Indian Ocean south of 10°S and east of 100°E it has been found to occur in large numbers and collected upto the region of Antarctic Convergence in the 110° E longitude. Like the foregoing, this species also has its maximum abundance in Tropical Indian Ocean and towards south they become fewer except in the region west of Australian coast.

Typhloscolex mulleri also has got a similar pattern in latitudinal distribution except for the fact that they are absent in Southwest Indian Ocean west of 60°E. *Travisiopsis levinseni*, another species under Typhloscolecidae, is of particular interest. This cold water species has been found in the warm equatorial water of the Indian Ocean. During the Northeast monsoon it is not recorded from the southern latitudes. Another species of the same genus, *T. lobifera* has a different pattern in having its maximum abundance in the region north of 15°N, thence become rare towards south excepting the Australian coast.

DISCUSSION

In spite of the shortcomings imposed by the nature of sampling the total catch of the pelagic polychaetes shows interesting variations in different latitudes. The abundance of various species at the northern tropical zone is of particular interest. This region is not only conspicuous for the abundance of the number of individuals of each

species but also for the number of species. The penetration of some of the cold water species into warm equatorial waters is another interesting aspect. *Travisiopsis levinseni* is a typical example for this. Previously it was known to have been recorded only from great depths of North and South Atlantic waters as well as from Antarctic water. But in the Indian Ocean it has been found to occur in the southern latitudes and Tropical waters as well.

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