

# DISTRIBUTION OF LARVAE OF FLATFISHES (HETEROSOMATA) IN THE INDIAN OCEAN

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Quantitative studies on the distribution of flatfish larvae in the Indian Ocean were made from 1548 standard zooplankton collections taken during International Indian Ocean Expedition (1960-1965). The larvae were represented in small numbers and that too only in 12.4% of the IIOE samples. They were more abundant in the northern half of Bay of Bengal than anywhere else in the Indian Ocean. The larvae were mostly concentrated in the neritic region. The salinity in this region was comparatively low. In the collections of central and southern Indian Ocean (between 52° and 100°E and 10° and 45°S) they were not present suggesting that larvae of flatfishes prefer seawater having comparatively lower salinity than in open sea.

## INTRODUCTION

The information on the distribution of the flatfish larvae is scanty. This may be due to the dearth for the larval material and the difficulty in identifying the planktonic stages. In this paper an attempt is made to furnish the quantitative distribution of the flatfish larvae in the Indian Ocean based on the 1548 standard plankton samples (IOBC, 1969) of the IIOE.

## MATERIAL AND METHODS

The flatfish larvae were subsorted and their number was ascertained. Since most of the samples contained only one or two larvae, they were presented in the distribution chart as such and the samples containing larvae ranging from 6 to 24 were considered as abundant. The percentage of larvae occurring in the Arabian Sea, Bay of Bengal, southeast and southwest Indian Ocean during day and night and in the two seasons (April 15 to October 15 and October 16 to April 15) were calculated. The range of salinity and dissolved oxygen at stations where flatfish larvae were present was also noted. Statistical analysis of the data was done wherever possible.

## RESULTS AND DISCUSSION

The larvae of flatfishes were comparatively few in number and were represented only in 12.4% of the IIOE standard samples. Of this 50% of the samples were from the Bay of Bengal, 35% from the Arabian Sea and the remaining from the rest of the Indian Ocean. When the data from different samples were combined irrespective of season or time of the day, the larvae were found to be more frequently represented near the southwest and east coasts of India, coasts of Burma and Thailand (Fig. 1). Their density was found to be more along the coasts of Kerala, Bengal and Thailand and in the Strait of Malacca. It was found that 60% of the samples containing flatfish larvae had only one larva and 20%

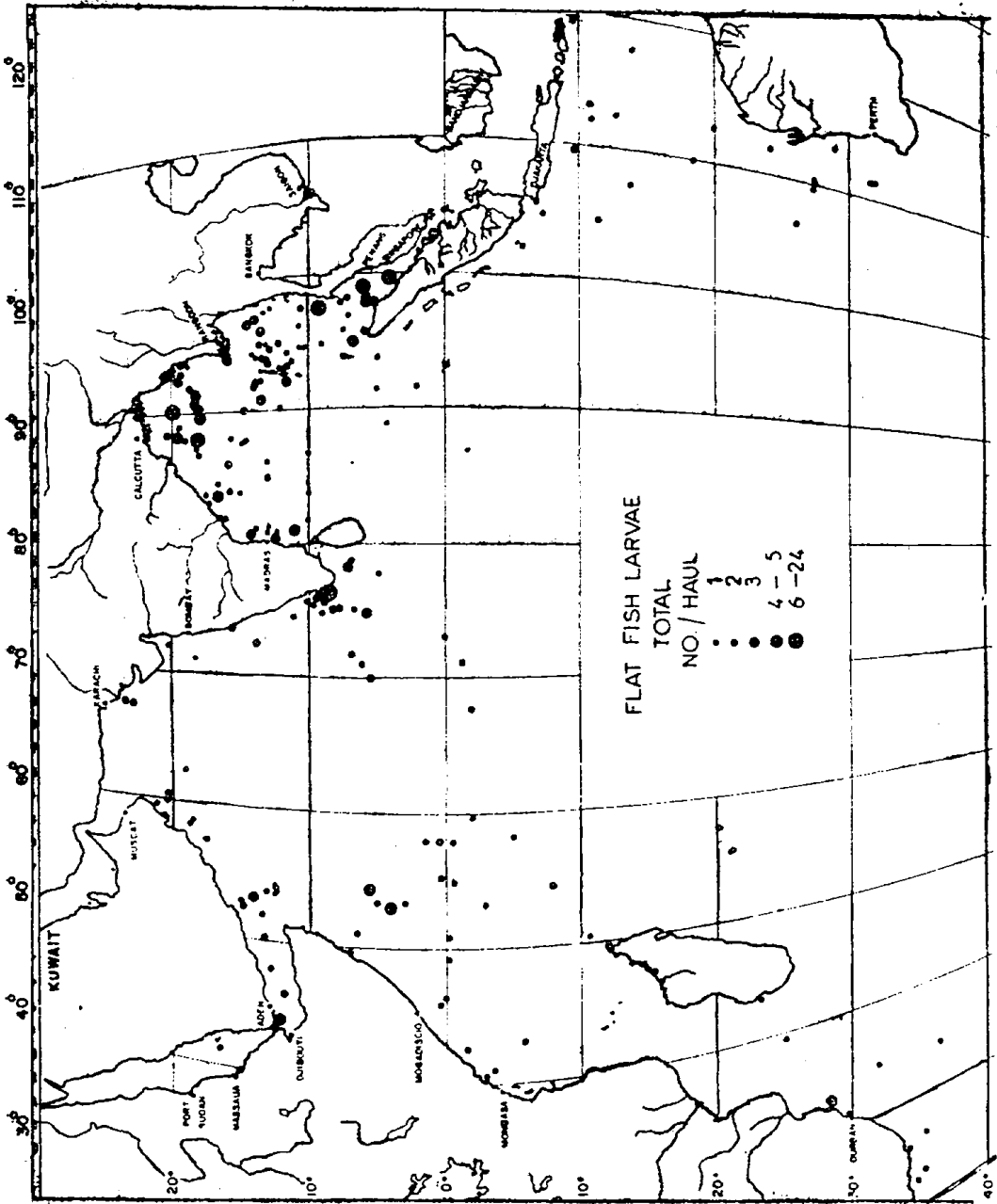


Fig. 1. Chart showing the distribution and abundance of flatfish larvae in the Indian Ocean.

## Distribution of Flatfish Larvae

of the samples had two each. The maximum number of 24 larvae, recorded from the Kerala coast was found in only one sample. In general, it could be stated that the flatfish larvae were distributed mainly in the coastal waters. In the Bay of Bengal, 62.5% and in the Arabian Sea 51.5% of the samples containing flatfish larvae were collected between April 16 and October 15 period. About 66% of the larvae were collected from the Bay of Bengal and 59% from the Arabian Sea during the above period. The collections made during the day contained comparatively lesser number of larvae than the night collections in both the Arabian Sea and the Bay of Bengal - 43 and 35% respectively.

Statistical analysis of the data using 't' test showed that the calculated 't' values were not significant in the case of seasonal and diurnal variations indicating that there was no statistically significant difference in the number of larvae in the samples taken during the two seasons as well as between day and night. But when the data for Bay of Bengal and Arabian Sea were compared, it was found that the values for Bay of Bengal were significantly different ( $p < 0.01$ ), being more abundant in Bay of Bengal than in the Arabian Sea. The value for 't' was 2.78 with 162 degrees of freedom.

The ranges of salinity in Bay of Bengal and Arabian Sea from where larvae of flatfishes were collected were 28.69 to 35.32‰ and 32.56 to 36.6‰ respectively.

The coefficient of correlation between the number of flatfish larvae with temperature, salinity, phosphate-phosphorous, nitrate-nitrogen and dissolved oxygen were calculated. The number of larvae and salinity showed a significant negative correlation ( $p < 0.001$ ) indicating that their numbers decreased as salinity increased. This might explain the more frequent occurrence of flatfish larvae in Bay of Bengal than in the Arabian Sea where the salinity range is lower than that of the Arabian Sea. Similarly, the number of larvae and dissolved oxygen content also showed a negative correlation ( $p < 0.001$ ) suggesting that the number decreased as oxygen value increased. The ranges of dissolved oxygen in the Bay of Bengal and in the Arabian Sea were 0.13 to 5.59 and 0.14 to 6.69 ml/l respectively. The correlation coefficients of temperature and nutrients did not show significant differences at 5 per cent level.

It appears that the Central Indian Ocean between 52° and 100°E and 10° and 45°S was not favourable for the larvae of flatfishes because they were absent in the plankton samples from this area.

When monthwise distribution pattern was studied it was found that the larvae were more abundant in samples of April and the lowest was recorded in October.

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