

**M.S.26. GOPALAKRISHNAN, T.C. – Studies on the Planktonic
Copepods - Calanoida: Scolecithricidae-of the Indian Ocean
1982 – Dr. C.V. Kurian**

Plankton forms the basic food supply for marine life, especially to fishes. The

areas of abundance of zooplankton were found to support the areas of world's commercial fisheries.

Copepods, though small in size, are the most abundant of all crustaceans, forming the bulk of the animal substance of the sea, accounting for about 70–90% of the zooplankton. Being the major primary consumer and the efficient link in the marine food web, its study is one of almost importance. Among the copepods calanoids rank first in abundance and among calanoids scolecithricid copepods are found in all the oceans with their abundance in the tropics.

Our knowledge on the taxonomy and distribution of the scolecithricid calanoids from the Indian Ocean is mainly based on some of the earlier expeditions in this region. No attempt has hitherto been made for such a comprehensive study involving methodically collected samples covering the entire Indian Ocean. The main purpose of this study was to outline the main distributional features of the species of the calanoid copepod family Scolecithricidae in the Indian Ocean and to distinguish and describe their niches.

The study was carried out using the zooplankton samples collected from the euphotic zone of the Indian Ocean, during the International Indian Ocean Expedition, 1960–65.

Twenty seven species of Scolecithricidae, belonging to 7 genera were identified. Their taxonomic features were briefly described with the help of suitable illustrations. One species viz *Macandrewella cochinensis* was described as a new species. *Scolecithricella tropica* and *Scottocalanus australis* were new records from the Indian Ocean.

Scolecithrix danae, *Scolecithricella bradyi*, *Scaphocalanus echinatus*, *Scolecithricella ctenopus*, *S. tenuiserrata*, *S. dentata*, *S. abyssalis* and *Scaphocalanus curtus* had high frequency of occurrence being present in 82.3, 63.6, 34.3, 31.7, 49.1, 34.0, 43.4 and 35.1% of the total stations and contributed to 59.7, 6.5, 6.2, 5.1, 4.4, 3.7, 3.6 and 3.4% of the total Scolecithricidae collected.

Scolecithrix nicobarica, *Lophothrix angusta*, *Scolecithricella marginata*, *Amalothrix indica*, *Scolecithricella vitata*, *Scottocalanus daughlihi*, *S. securifrons* and *Scolecithricella ovata* had low numerical abundance of 1.6, 1.1, 1.0, 0.7, 0.5, 0.5, 0.4 and 0.4% of the total Scolecithricidae, but with a medium range of occurrence of 19.5, 27.5, 13.8, 8.6, 17.1, 7.3, 11.2 and 14.3% respectively in total stations.

The remaining 11 species viz. *Scaphocalanus longifurca*, *S. affinis*, *Scolecithricella tropica*, *Amalothrix arcuata*, *Scottocalanus persicans*, *S. farrani*, *S. helenae*, *Lophothrix frontalis*, *Macandrewella cochinensis*, *Scottocalanus australis* and *S. thomasi* were rare species contributing to 0.3, 0.1, 0.1, 0.02, 0.003, 0.2, 0.1, 0.1, 0.2, 0.02 and 0.03% respectively of total Scolecithricidae and having very low frequency of occurrence of 2.9, 3.9, 3.1, 0.3, 0.3, 2.8, 2.1, 2.6, 1.0, 1.8 and 1.0% respectively in total stations.

S. vitata and *M. cochinensis* were nonmigrant, near surface species and *S. curtus* was a nonmigrant mid water species. Others were extensive migrants undertaking nocturnal migrations in the neritic and oceanic waters.

The most abundant and widely distributed, *S. danae* contributed to a higher production during southwest monsoon period whereas 19 other species showed intensive production during northeast monsoon period.

Of the 27 species 18 were common to Indian, Atlantic and Pacific Oceans, 6 were confined to Indo-Pacific waters and 3 were endemic to the Indian Ocean.

Two species were neritic as well as oceanic in occurrence and abundance, 17 were oceanic and 8 were neritic.

The following 10 patterns of distribution were noticed.

1. 25°N–40°S: *S. danae*, *S. curtus* and *S. bradyi* - tropical and subtropical.
2. 25°N–30°S: *S. echinatus* and *S. tenuiserrata*.
3. 25°N–20°S: *S. abyssalis*, *S. ctenopus* and *S. nicobarica*. - mostly tropical.
4. 25°N–10°S: *S. marginata* and *S. longifurca*.
5. North of equator
(Arabian Sea and: *A. indica*, *S. daughlishi* and *M. cochinchensis*. Bay of Bengal).
6. 10°N–40°S: *S. dentata*, *S. tropica* and *L. angusta*..
7. 10°N–30°S: *S. vitata*.
8. 10°N–20°S: *S. securifrons*, *S. ovata* and *S. helenae*.
9. 10°N–10°S: *S. affinis*, *S. farrani* and *L. frontalis* - purely tropical
10. South of equator upto 20°S: *S. australis* and *S. thomasi*.

Species diversity increased from neritic to oceanic waters. Around 3 species per haul were present in neritic waters and upto 15 in the oceanic waters.

Studies on the co-existence of species showed that *S. danae* and *S. abyssalis* were significantly correlated with 75% of the rest. *S. danae*, *S. bradyi*, *S. abyssalis*, *S. ctenopus*, *S. echinatus*, *L. angusta*, *S. nicobarica*, *S. tropica* and *S. thomasi* were significantly correlated with 60% of the rest. The correlation coefficient matrix showed that more than 75% species had different environmental requirements. Salinity was the most important factor followed by temperature and oxygen in the Arabian Sea, oxygen followed by temperature and salinity for Bay of Bengal, oxygen followed by salinity and temperature for southwest Indian Ocean and none was significant for the southeast Indian Ocean. For the Indian Ocean as a whole the order of significance was salinity followed by oxygen and temperature. A multiple regression model significant at 1% level indicated that the fitted regression was capable of explaining only 11% of the variables in the prediction of the abundance of Scolecithricidae. Calculation of Fishers diversity index α and its variation showed that the type of environments in the different areas of the Indian Ocean were more or less of the same kind.