Distribution of Pelagic Polychaetes in the North-West Australian Sea during Winter

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Out of 32 species of pelagic polychaetes recorded in the Indian Ocean only 17 are found in the north-west Australian Sea during December 1963 and January 1964. A distinct pattern in the distribution of a few tropical species is observed in the area north of 17°S. The species like Sagitella kowalevskii and Phalacrobothridium uniformis commonly met with in the 1st yr are totally not encountered in the samples from the same area in the 2nd yr. The northern tropical zone is not only rich in species but also in abundance.

During exploratory tuna fishing, the research vessel Oshoromaru collected 61 samples of plankton as a part of the International Indian Ocean Expedition (1960-65) from the north-west Australian Sea. The 1st cruise (12 Dec. 1962 to 19 Jan. 1963) covered the area between Sunda Islands and the north-west coast of Australia (10° to 30°S and 105° to 114°E). The samples were collected in vertical hauls from 200-0 m using Indian Ocean Standard net. There was great disparity in the spatial coverage and density between the two cruises.

A preliminary report on the species composition of Cladocera, Ostracoda, Pteropoda, Heteropoda and Thaliacea has been published, and the species distribution of pelagic polychaetes studied from the duplicate samples sent to Indian Ocean Biological Centre is reported herein.

Of the 32 species of pelagic polychaetes (excl: Tomopteridae) recorded in the Indian Ocean (Peter, G., unpublished data) 17 species belonging to 3 families are present in the north-west Australian Sea. The distribution of various species is given in Figs. 2 to 4. The family Phyllodocidae is represented by 9 species, Alciopidae and Typhloscolexidae by 4 species each. Lopadorhynchus indica has wide spread distribution from 10° to 25°S. There are 14 records in the 1st cruise and 2 in the 2nd cruise (Fig. 3). Pelagobia longicirrata is found in 11 stations in the 1st cruise and 3 in the 2nd cruise. Phalacrobothrria uniformis, Alciopina pumantan and Vanadis minuta are very few in number. Plotohelmin capitate is found only in the area north of 17°S during both cruises. Sagitella kowalevskii is having cosmopolitan distribution like Lopadorhynchus indica, reaching the maximum abundance in region 2 indicating that these species are more tropical. All the 17 species occur in region 1. The most abundant and frequent species occurring in region 1 is Typhloscolex mulleri and in region 2 Sagitella kowalevskii (Fig. 4).

In general the species of tropical dominance occur predominantly in region 1 or the northern zone which is more under the influence of South Equatorial current. They are Plotohelmin capitate, L. nationalis, L. appendiculatus, M. caeca, M. gracilis, Pedinosoma curturn, and Alciopina parasitica. Similar pattern of distribution is observed in Evadne tergestina, Cavolinia longirostris, Diacria quadrimaculata and Iasis zonaria. Even though no distinct pattern is observed for the southern subtropical zone as found by Motoda et al. in the case of Evadne spinifera and Pyrocypris lepidophora it may be mentioned that the cosmopolitan species Sagitella kowalevskii reaches its maximum abundance in region 2 or the southern zone (Fig. 4). The poor coverage in the latter zone does not permit any conclusion about the distribution pattern of subtropical species. A few species, such as L. indica, S. kowalevskii, and T. mulleri are having cosmopolitan distribution in both zones.

It is interesting to note that Sagitella kowalevski, one of the most abundant and frequent species which is of low salinity mixes with high salinity waters from the east at 17°S. These are the 2 principal water masses existing in the Eastern Indian Ocean during December. Based on this the area under consideration can be divided into 2 regions, 1 on the north and 2 on the south of 17°S. So the 2nd cruise is restricted to region 1 only which is more tropical.

Lopadorhynchus nationalis, L. appendiculatus, M. caeca, M. gracilis, Pedinosoma curturn, Alciopina parasitica, P. longicirrata and L. indica, reaching the maximum abundance in region 2 indicating that these species are more tropical. All the 17 species occur in region 1. The most abundant and frequent species occurring in region 1 is Typhloscolex mulleri and in region 2 Sagitella kowalevskii (Fig. 4).

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Figs. 2 to 4 - Distribution of different species of pelagic polychaetes observed during cruise 1 (left) and 2 (right)
in the first year is not encountered in the same region during the next year. The reason for this total absence of a common species in the collections from more or less the same area in the same period of the subsequent year is not clear. Analysis of the data on a diurnal basis shows that in the 1st yr the species is recorded from 27 stations out of which more than two-thirds are covered during day. But out of the 13 collections of the 2nd yr 11 are made during night.

Tomopterids also occur in large numbers but owing to the bad state of preservation the species identification could not be made.

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References

Incidence of Microsporidosis in the Prawn, Metapenaeus monoceros (Fabr.)

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Microsporidiosis, infection by a microsporidan parasite, tentatively identified as Nosema sp., has been reported in the prawn, M. monoceros. The infected hosts are flaccid and milky in appearance and died after capture.

While making routine observations on the prawnlandings in the Pulicat Lake, Adyar estuary, it was observed that few individuals of Metapenaeus monoceros (Fabricius), a common commercial prawn of the area, were flaccid and showed a distinctly different colouration from the normal prawns. White liquid oozed out of them under pressure.

All the specimens were dark brown in colour with milky white patches and the rostrum was slightly arched. The muscle tissue was white and opaque. In all the other features the specimens were identical with normal specimens (Fig. 1). The soft consistency of the body would have, in the normal course, indicated that the specimens were freshly moulted forms. But a microscopic examination of the internal body parts revealed that the muscle tissue and other body parts were heavily infected with spores of a microsporidan parasite, and the softness of the body was caused by this infection. All the infected parts were white in colour. Concentration of spores in various parts of the body appeared as milky patches and they were mainly confined to the muscles. In heavily infected individuals the abdominal pleura were swollen.

The spores are minute oval bodies with a central nucleus (stained with iron haematoxylin). A single polar filament is noticed under mechanical pressure. This description conforms to the family Nosematidae Labbe (Monocnidea, Microsporidia). Eight genera are included in this family and the present description conforms to the genus Nosema Nageli emend Perez 1. Although there are many species described from several invertebrates, only two species, Nosema nelsoni Sprague and N. Pulvis are known from peraeid prawns 2. The hosts are described as 'cotton shrimp' ('milk shrimp') due to their texture and colouration as in the present case.

The spores in the present case resemble those of N. nelsoni in shape and size except for the absence of the posterior crescent shaped area.

M. monoceros is an euryhaline form tolerating wide variations in salinity and is capable of surviving several minutes out of water, however, no trace of life is noticed in the infected individuals. Apparently the microsporidan is highly pathogenic and might be taking a heavy toll of the prawns in nature. The size range of the infected individuals is similar to other normal specimens in the commercial catch. Obviously all sizes are susceptible to infection and death. The infected individuals are observed throughout the year, but in relatively more numbers during the monsoon season. It is quite likely that the infection may take an epidemic form during this season.

A significant finding of the present study is that the infection is confined to only one species, M. monoceros, while the associated species in the same catch are free from infection, indicating host specificity.

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References