

8. With the reversal of the pressure gradients across the country by mid-October the south-west monsoon gives place to the north-east monsoon over the south of the peninsula. Pressure gradient between Delhi and Nagpur increases only very gradually after mid-October while it increases steeply between Nagpur and Trivandrum reaching the peak value by mid-December.

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ON THE OCCURRENCE OF INTERSTITIAL FAUNA IN THE INTERTIDAL SANDS OF SOME ANDAMAN AND NICOBAR GROUP OF ISLANDS

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THE marine interstitial fauna, inhabiting the intertidal zone on Indian coasts, is receiving considerable attention during recent years. Studies on the fauna inhabiting the beach sands of Waltair coast, during the years 1960-1963, have revealed the occurrence of several interesting invertebrate groups of animals. A comprehensive report on the results of the investigation, first of its kind in Indian waters, has already been published (Chandrasekhara Rao and Ganapati, 1968) and several species have been described as new to science.

During a brief faunistic survey of the Andaman and Nicobar group of islands, undertaken by the Zoological Survey of India in February to April 1969, the author had an opportunity to visit the archipelago and examine intertidal sands on the various isles located in the vicinity of North, Middle, South and Little Andamans and Car Nicobar island. No previous records of interstitial fauna are known from the archipelago and a detailed report of the fauna collected in the present survey is being published elsewhere. The present account deals with the preliminary results concerning the nature of the habitat, composition of the fauna and the relationship of the faunal element with the physiography of the islands.

NATURE OF THE HABITAT

In the majority of these islands, the coast is mostly rocky, with the cliffs almost descending right into the waters. The rocks and boulders in the intertidal zone are not covered with sufficient algal growths and as such, a rich community of algal fauna characteristic of rocky shores is missing. Some muddy beaches

are also encountered, especially near the mangrove swamps located at the mouths of brooks. Except for a few islands, the sandy beaches are limited to certain patches occurring here and there between cliffs. The slope in several beaches is low and the amplitude of the tides is high, with the result a wide intertidal belt is exposed during low tides. The beach sand is mostly composed of silica except in those islands harbouring rich coral growths, where the sand is exclusively coralline. The colour of the sands vary from black and light-yellow to reddish-brown, while the coralline sands are purely white. The shape of sand-grains varies from spherical to angular. Except in a few cases, the sands are relatively heterogeneous, composed of coarse, medium and fine particles with a mean diameter of $> 500 \mu$, $300-500 \mu$ and $< 300 \mu$, respectively. The bulk of the beach sands are fine, although the grain size tends to increase with depth. A small percentage of broken shells is mixed with sand, especially near the water's edge. The compactness of coralline beaches is low, due to the lightness of grains and the lack of cohesion between particles.

The climate is tropical, with heavy gales and rains. The temperature in the interstitial biotopes varied from 26°C . to 30°C . while the salinity of the interstitial water ranged between 29‰ and 33‰. The sands appear sufficiently rich in organic detritus.

COMPOSITION OF THE FAUNA

A quantitative estimation of the interstitial fauna inhabiting the various islands is made and an average percentage composition of the density of different groups is given in Table I.

TABLE I

Percentage composition of diverse groups of interstitial fauna inhabiting the intertidal sands of some Andaman and Nicobar islands

Group	North Andaman	Middle Andaman	South Andaman	Little Andaman	Car Nicobar	Combined average
Cœlenterata ..	0.5	..	4.0	3.0	..	1.5
Turbellaria ..	3.0	2.0	3.5	3.0	4.0	3.1
Nematoda ..	3.0	2.5	4.0	3.5	2.0	3.0
Gastrotricha ..	..	..	2.0	0.5	1.5	0.8
Nemertinea ..	1.5	0.5	0.5	0.5	1.0	0.6
Rotifera ..	0.5	1.0	2.0	..	..	0.7
Archiannelida ..	8.0	8.5	12.0	7.5	9.0	9.0
Polychæta ..	13.5	15.0	8.5	11.0	12.0	12.0
Oligochæta ..	1.5	3.0	1.0	1.0	0.5	1.4
Ostracoda ..	2.5	1.0	2.0	0.5	3.0	1.8
Copepoda ..	42.0	41.0	37.5	55.0	46.0	44.3
Isopoda ..	11.0	14.5	16.0	10.0	13.5	13.0
Amphipoda ..	5.0	6.5	3.5	2.5	4.0	4.3
Tardigrada ..	..	..	1.0	0.5	..	0.3
Acarina ..	2.5	1.5	2.0	0.5	2.0	1.7
Collembola ..	1.5	0.5	..	..	1.0	0.6
Mollusca ..	1.5	0.5	..	1.0	0.5	0.7
Echinodermata ..	2.5	2.0	0.5	..	..	1.0

The density of Protozoa could not be correctly assessed. The bulk of the fauna (nearly 80%) on the archipelago consists of Copepoda, Isopoda, Polychæta and Archiannelida, in the order of their abundance. The Amphipoda, Turbellaria and Nematoda nearly comprise 10% of the fauna. Other groups of animals are represented by very small numbers. No records of Kinorhyncha, Mystacocarida and Tunicata are made in the present survey.

A qualitative estimation of the fauna has indicated that Copepoda, Polychæta, Turbellaria, Nematoda and Archiannelida, in their order comprise the majority of the species; while all the other groups are limited to a very few species.

FAUNAL ELEMENT IN RELATION TO THE PHYSIOGRAPHY OF THE ISLANDS

The physiography of the islands presents certain inhospitable conditions for the development of typical interstitial fauna, influencing their density and distribution. In the

majority of localities investigated, the density of fauna is relatively poor compared to the mainland fauna reported on Waltair coast. The absence of extensive beaches coupled with the nature of finer substrate, seems to retard the colonization of the fauna. In several beaches, the interstices are literally choked with fine sand, mud, detritus or coralline powder, where a critical level has reached and this may act as a detrimental factor for the faunal proliferation and distribution. In certain areas with sufficient coarse sand containing well-developed interstitial fauna, a 100 cc sand sample yielded 600-750 specimens of diverse groups compared with 900-1150 specimens on the Waltair coast.

In beaches with muddy sand, the fauna mainly comprises of poor populations of ciliates, nematodes, rotifers and oligochætes. The interstitial Turbellaria, Nematoda and Gastrotricha, normally forming the typical component of the intertidal sands, are poorly represented on the archipelago.

The quantitative and qualitative estimations have also indicated that the composition of the faunal element does not differ very much from island to island, despite a variation in the nature of the habitat and their isolation by the seas. Few species have been found endemic, with restricted distribution to certain isles of the archipelago. However, the present study has revealed that several interstitial species discovered on these islands have already been reported on the Waltair coast, throwing considerable light on the geographical distribution of the fauna.

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