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PRELIMINARY REPORT ON THE TRANSPORT OF FORAMINIFERA INTO COCHIN BACKWATER*

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ABSTRACT

In a series of sediment-samples from the Cochin Backwater 12 living species of benthic foraminifera were found. Three of them are common and all the others are more or less rare. Eleven other species are represented only by dead specimens. These are common in the samples from the shallow open ocean off Cochin Harbour. Therefore, it is concluded that they were transported into the backwater by tidal currents.

INTRODUCTION

IN January and February 1965 a series of sediment samples were taken from the Cochin Backwater and the shelf off Cochin and Alleppey with the kind help of the Indian National Institute of Oceanography and the Department of Marine Biology and Oceanography of the Kerala University at Ernakulam. I wish to express my thanks to Dr. N. K. Panikkar and Dr. C. V. Kurian as well as their staff members.

A comparison between the foraminiferal fauna from the sea and the adjacent backwater was one of the aims of this investigation. Though the study, especially of the samples from the shelf, is not yet finished, a short report covering the results of the investigations in the backwater can be given here.

RESULTS

The samples (Fig. 1) were stained with Bengalred immediately after they had been taken (method of Walton, 1952)[1]. Thus, the separation of living and dead animals was possible. Twelve living species and 23 dead species were found. All the living forms do not occur together in each sample; the normal number being about 5. Only one sample contained as many as 7 species. The most common forms are *Ammonia sobrina* (Shupack), which is typical for brackish water, and *Discorbis tepida* (Cushman), also an animal which tolerates strong environmental changes. Another significant species is a globular, very fragile *Trochammina* which resembles *Trochammina globulosa* Cushman. However, it is very common in only one sample and occurs in a total of no more than 4 samples. Living *Trochammina* cf. *globulosa* and *Ammonia sobrina* were found exclusively in the backwater while all the others also exist in the open sea.

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[1] Walton, W. R. 1954. Techniques for recognition of living Foraminifera. *Contr. Cushman Found. Foram. Res.*, 3 (2) : 56-60.

These are :

Miliammina sp.
Ammobaculites persicus (Utze)
Quinqueloculina miletti (Wiesner)
Bolivina striatula Cushman
Elphidium somaense Takayanagi
Protelphidium cf. *schmitti* (Cushman & Wickenden)
Nonion asterizans (Fichtel and Moll)
Cassidella panikkari Seibold
Globigerina sp.

All these species are, with the exception of *Quinqueloculina miletti*, uncommon. Two of them, *Nonion asterizans* and *Cassidella panikkari* are extremely rare and may occur here only accidentally, having been only recently transported into the Cochin Backwater.

The larger number of dead species can be explained by transport from the ocean into the Cochin Backwater by tidal currents.

There are several arguments to support this assumption. The dead species which occur in larger numbers are those which constitute the main elements of the fauna from the shelf, e.g. *Nonion asterizans* (Fichtel and Moll) and *Asterorotalia dentata* (Parker and Jones).

Further proof is provided by the abundant occurrence of planktonic foraminifera in some samples. They must have been transported from their marine environment into the Cochin Backwater.

An additional argument is the ratio between living and dead species in the samples which contain numerous *Globigerina* tests. Examples are given in Table 1. The number of dead species is doubled in samples with *Globigerina*.

The ratio between living and dead individuals shows the contrast even more clearly. The extremely high ratio of 1 : 23 in sample 7 offers more proof; the map shows that sample No. 7 is situated near the inlet of the Cochin Backwater.

TABLE 1

Sample No.	Species living	Species dead	Individuals living	Individuals dead	Ratio	Depth of water
Samples with abundant Globigerina						
3	7	16	30	268	1 : 8.9	7 m
4	6	15	35	164	1 : 4.7	1.2 m
7	5	16	23	539	1 : 23	11.0 m
Samples with few or no Globigerina						
2	4	8	278	684	1 : 2.4	1.3m
5	5	6	25	34	1 : 1.3	5.2 m
8	5	8	24	69	1 : 2.8	2 m

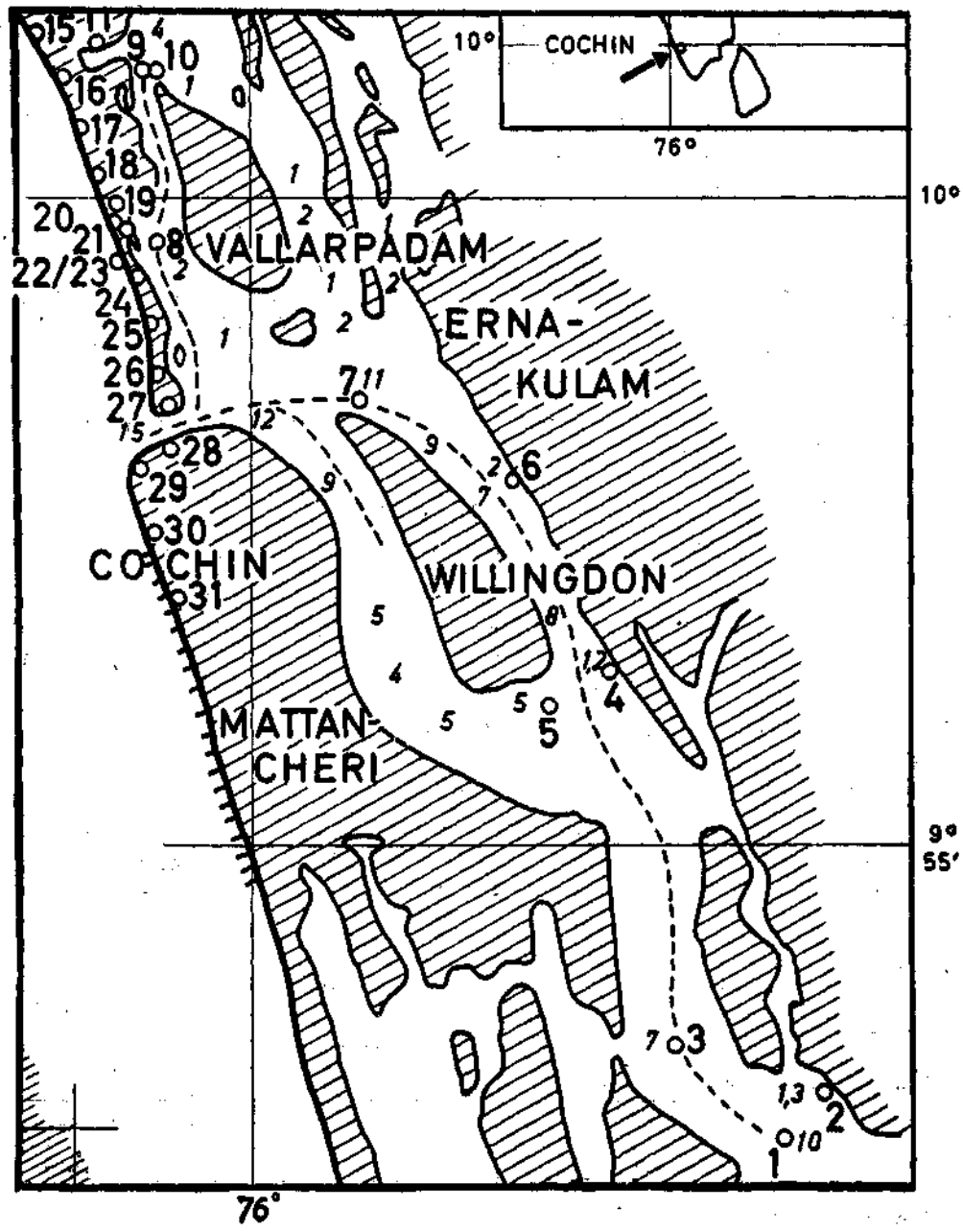

FIG. 1. Map shows the sampling stations in the Cochin Backwater and adjacent inshore waters.

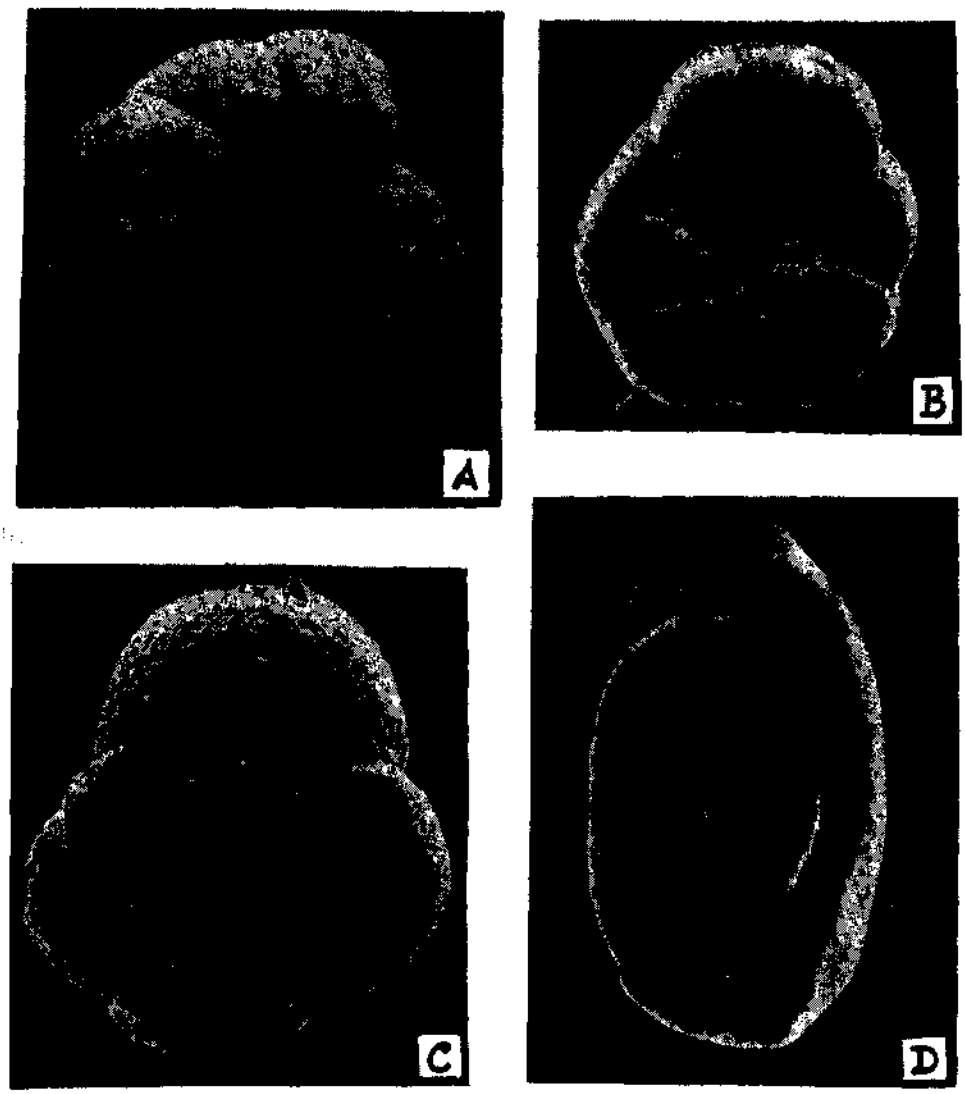

PLATE I. A. *Ammonia sobrina* (Shupack) ventral, sample Nr. 2, x 260; B. *Discorbis tepida* (Cushman) ventral, sample Nr. 2, x 265; C. *Trochammina* cf. *globulosa* Cushman, dorsal, sample Nr. 2, x 210 and D. *Quinqueloculina miletti* (Wiesner), sample Nr. 2, x 200.

In constrast, the ratio is reduced in the samples without or with only a few *Globigerina* as illustrated in Table 1. The surprisingly high number of empty tests in sample 2 is not due to transportation. By chance this sample was taken from a location with an unusually rich living population. Thus, the production of empty tests is high. The 684 tests include 310 specimens of *Throchammina* cf. *globulosa*, 236 of *Ammonia sobrina* and *Discorbis tepida*, typical lagoonal forms. *Quinqueloculina miletti*, also regarded as a lagoonal form, contributes 130 specimens to the sample.

The planned detailed publication will give further information as well as more statistical data. Some Stereoscan-Photomicrographs and a map, which shows the position of the samples are added to illustrate the most important species of the Cochin Backwater fauna.