



RECENT OSTRACODA FROM ADYAR RIVER ESTUARY, CHENNAI, TAMIL NADU

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ABSTRACT

Twenty six species belonging to 23 genera were found in fifteen sediment samples collected from the Adyar river estuary, Chennai. The check list of the fauna is presented along with their zoogeographic distribution and abundance. The ostracods of Adyar river estuary show close affinity with those of the west coast of India and Persian Gulf in the west, and South China Sea and Malacca Strait in the southeast. *Caudites javana* and *Tanella gracilis* are found to be widely distributed in the study area. The distribution of ostracods in the estuary seems to be influenced by the nature of bottom sediments and salinity. From the carapace and valve ratio, it is assumed that a relatively fast rate of sedimentation prevails in the area.

Key words : Recent Ostracoda, Adyar river estuary, Chennai.

INTRODUCTION

Though Recent Ostracoda from marine waters on the east and west coasts of India (Jain, 1978, 1981; Bhatia and Kumar, 1979; Vaidya and Mannikeri, 1994; Naidu *et al.*, 1997 and Hussain, 1998) are little known, the knowledge of brackish water fauna of this region is sparse. Hence, an attempt has been made to place on record the ostracod fauna from the brackish waters of Adyar river estuary.

The area under investigation is from the Adyar river estuary, Chennai (between 80°13' - 80°17' E and 13°0' - 13°3' N), Tamil Nadu, which forms part of Survey of India toposheet nos. 66 C/4 and 66 C/8. The Adyar river originates from the highlands of Sriperumbudur Taluk and it flows through Chingleput and Chennai districts for a distance of about 50 kms, and debouches into the Bay of Bengal, near Adyar. The water level in the stream is usually very low and gets flooded only during southwest and northeast monsoon periods. The Chennai city has an open sea beach, popularly known as the Marina, facing the Bay of Bengal. The beach is about five kms long and is flanked by the Cooum river in the north and the Adyar river in the south.

MATERIALS AND METHODS

Fifteen sediment samples were collected from the Adyar river estuary, Chennai. The first sample was collected at the mouth of the river (shore

sample) and the last sample near the Adyar bridge (fig. 1). Samples were collected using a country boat and with the help of a grab and a diver. All the samples were subjected to standard micropaleontological techniques, and ostracod fauna were separated from a unit weight of 100 gm sediment sample. Their detailed carapace morphology was studied and different species were identified. To obtain lucid illustrations, SEM photographs of all the ostracod species recorded were taken using a Scanning Electron Microscope (JEOL JSM 5300) and presented in Plates I and II. All the illustrated specimens are deposited in the Museum of the Department of Geology, University of Madras, with Register Nos. MUGDARE 1-26.

For the sake of brevity, only a check-list of the ostracod taxa recorded in the study area is presented in table 1, along with their frequency and zoogeographic distribution.

In the study area, twenty six species belonging to 23 genera have been identified. The fauna recorded herein not only shows marked similarity with those of other parts of the east and west coasts of India, but also exhibits a close affinity with those of the Persian Gulf, South China Sea, and Malacca Strait. The following taxa are common to those recorded from Abu Dhabi lagoon (Bate, 1971), Persian Gulf (Paik, 1977), South China Sea (Zhao *et al.*, 1985), Malacca Strait (Whatley and Zhao, 1987, 1988) and Sedili river and Jason Bay (Zhao

Table 1 : A check list of the fauna encountered in the study area along with their frequency and zoogeographic distribution.

Sl. No	Name of the species	East coast	West coast	Indo-Pacific area	Frequency
1.	<i>Bairdoppilata</i> (B.) <i>alcyonicola</i>	x	x	x	R
2.	<i>Basslerites liebauti</i>	x	x	-	C
3.	<i>Bradleya andamanae</i>	x	x	-	R
4.	<i>Callistocythere</i> sp. cf. <i>C. flavidofusca intricatoides</i> .	x	x	x	C
5.	<i>Caudites javana</i>	x	x	x	A
6.	<i>Chrysocythere keiji</i>	x	x	x	C
7.	<i>Cyprideis</i> sp.	-	-	-	C
8.	<i>Cypridopsis vidua</i>	-	x	x	C
9.	<i>Cyprinotus salinus</i>	-	x	x	C
10.	<i>Cytherelloidea</i> sp. cf. <i>C. leroyi</i>	x	x	x	C
11.	<i>Hemicytheridea reticulata</i>	x	-	x	C
12.	<i>Hemikritha</i> sp.	-	-	-	C
13.	<i>Keijella reticulata</i>	x	x	x	C
14.	<i>Mutilus pentoekensis</i>	x	x	x	R
15.	<i>Neocytheromorpha</i> sp.	-	-	-	R
16.	<i>Neocytheretta murilineata</i>	x	-	x	R
17.	<i>Neomonoceratina iniqua</i>	x	x	x	C
18.	<i>N. porocostata</i>	x	-	X	R
19.	<i>N. spinosa</i>	x	-	X	R
20.	<i>Paijenborchellina</i> sp. cf. <i>P. prona</i>	x	x	-	R
21.	<i>Paracypris polita</i>	-	-	x	R
22.	<i>Phlyctenophora orientalis</i>	x	x	x	R
23.	<i>Physocyprina</i> sp.	-	-	-	R
24.	<i>Stigmatocythere indica</i>	x	x	x	R
25.	<i>S.</i> sp.	-	-	-	R
26.	<i>Tanella gracilis</i>	x	x	x	A

R - Rare 0-10 specimens; C - Common 11-25 specimens; A - Abundant > 25 specimens

and Whatley 1989): *Callistocythere* sp. cf. *C. flavidofusca intricatoides*, *Caudites javana*, *Cytherelloidea* sp. cf. *C. leroyi*, *Hemicytheridea reticulata*, *Keijella reticulata*, *Mutilus pentoekensis*, *Neocytheretta murilineata*, *Neomonoceratina iniqua*, *Phlyctenophora orientalis*, *Stigmatocythere indica* and *Tanella gracilis*.

OSTRACOD POPULATION AND DISTRIBUTION

The study reveals that the ostracod population size ranges between 12 and 85 (Table 2), with the minimum at station 1 and the maximum at station 7 of the sample collection. The first sample (sample no.1) which was collected at the shore was found to be least populated, and this may be due to the constant agitation caused by the ebb and flow of the water.

Sand, silt and clay fractions in the sediment were estimated by the pipette method (Krumbein and Pettijohn, 1938). The relative abundance of sand, silt, clay of these 15 samples were plotted on trilinear diagrams. Trefethen's (1950) textural nomenclature was used to describe the sediment types. Out of the 12 possible sediment types of Trefethen, the substrate of the Adyar estuary consists of sand (stations 1&2), silty-sand (stations 3,5,6,7,10,14), clayey-silt (stations 4,11,12,13,15) and sandy-clay-silt (stations 8,9). Of these 4 types, clayey-silt and silty-sand are the more favourable substrates for the abundance of ostracod population. The highest population values are where the aforesaid substrate

Table 2: Ostracod population size in the Adyar river estuary (actual number of specimens per 100 gm of sediment).

Station Number	Depth in meters	Population	Sediment type
1.	<1	12	Sand
2.	1.1	41	Sand
3.	1.3	37	Silty-sand
4.	1.4	78	Clayey-silt
5.	1.5	20	Silty-sand
6.	2.2	26	Silty-sand
7.	2.4	85	Silty-sand
8.	3.0	38	Sand-clay-silt
9.	3.5	35	Sand-clay-silt
10.	3.1	72	Silty-sand
11.	3.2	82	Clayey-silt
12.	3.4	57	Clayey-silt
13.	3.5	62	Clayey-silt
14.	3.2	73	Silty-sand
15.	3.0	82	Clayey-silt

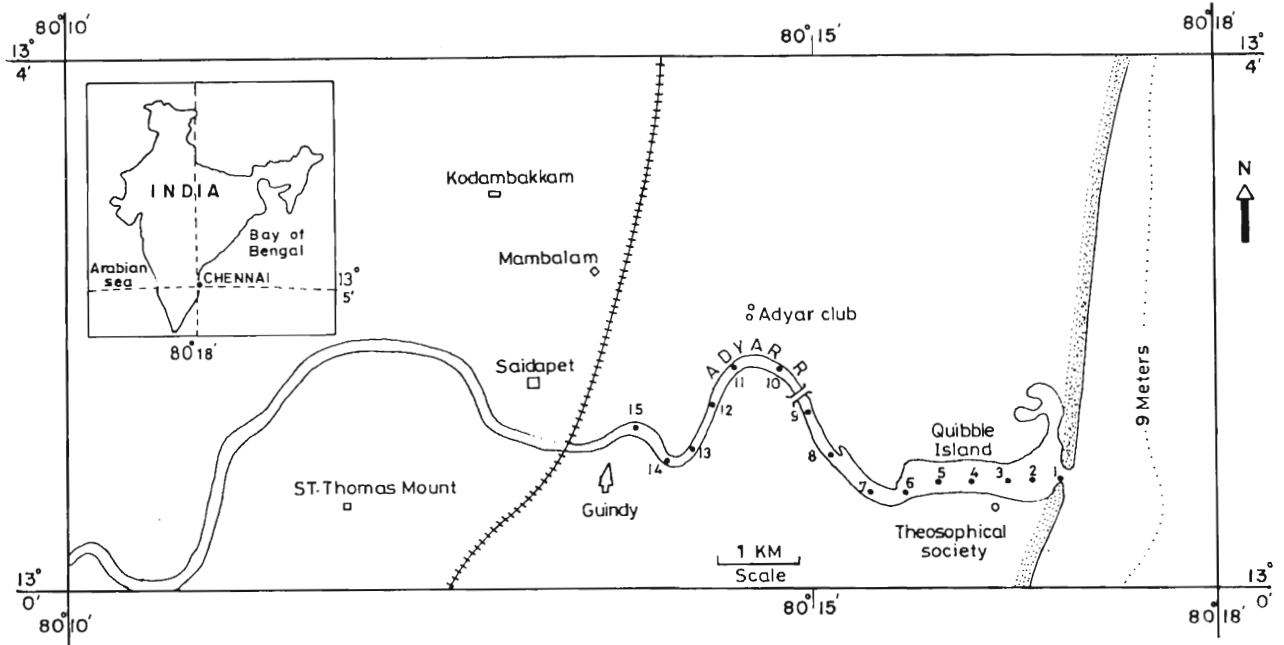


Fig. 1. Map showing locations of samples collected from the Adyar River Estuary, Chennai.

consists of medium to fine grained sediment. Hence, it is observed that the nature of the bottom sediment is one of the controlling factors of the ostracod population.

Out of the 26 species encountered, *Caudites javana* and *Tanella gracilis* have been recorded in all the samples collected, where as *Bairdoppilata* (*B.*) *alcyonicola*, *Basslerites liebauti*, *Callistocythere* sp. cf. *C. flavidofusca intricatoides*, *Chrysocythere keiji*, *Cytherelloidea* sp. cf. *C. leroyi*, *Hemicytheridea reticulata*, *Keijella reticulata*, *Neomonoceratina iniqua* and *Phlyctenophora orientalis* occur in as many as 11 samples. *Cypridopsis vidua*, *Cyprinotus salinus* and *Paracypris polita* are found to occur only in the latter segment of the estuary, i.e. the sample nos. 8-15, indicating a brackish water to fresh water habitat.

A total of 790 ostracod specimens (all the species in 15 samples) have been recovered. A close examination of carapace (82%) and open valve (18%) ratio reveals that a relatively rapid rate of sedimentation prevails in the study area.

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EXPLANATION OF PLATES

Plate I

(Bar scale equals 100 μ m)

- 1-2. *Cytherelloidea* sp. cf. *C. leroyi* Keij, 1964
1, Left valve, external view; 2, ♀ left valve, internal view.
3. *Bairdoppilata (Bairdoppilata) alcyonicola* Maddocks, 1969
Right valve, external view.
4. *Hemicytheridea reticulata* Kingma, 1948
♂ Left valve, external view.
5. *Neomonoceratina iniqua* (Brady, 1868)
♀ Left valve, external view.
6. *Neomonoceratina porocostata* Howe and Mckenzie, 1989
Left valve, external view.
7. *Neomonoceratina spinosa* Annapurna and Rama Sarma, 1987
Right valve, external view.
8. *Paijenborchellina* sp. cf. *P. prona* (Lubimova and Guha, 1960)
Right valve, external view.
9. *Callistocythere* sp. cf. *C. flavidofusca intricatoides* (Ruggieri, 1953)
Left valve, external view.
10. *Tanella gracilis* Kingma, 1948
Left valve, external view.
11. *Cyprideis* sp.
Right valve, internal view.
12. *Hemikrihe* sp.
Left valve, external view.
13. *Chrysocythere keiji* Jain, 1978
Left valve, external view.

Plate II

(Bar scale equals 100 μ m)

1. *Stigmatocythere indica* (Jain, 1978)
Left valve, external view.
2. *Stigmatocythere* sp.
Left valve, external view.
3. *Keijella reticulata* Whatley and Zhao, 1988
Right valve, external view.
4. *Bradleya andamanae* Benson, 1972
Left valve, external view.
5. *Neocytheromorpha* sp.
Left valve, external view.

6. *Basslerites liebauti* Jain, 1978
Right valve, external view.
- 7-8. *Mutilus pentoekensis* (Kingma, 1948)
7. Right valve, external view; 8. dorsal view.
9. *Caudites javana* Kingma, 1948
Left valve, external view.
10. *Neocytheretta murilineata* Zhao and Whatley, 1989
Left valve, external view.
11. *Paracypris polita* Saras. 1866
Right valve, internal view.
12. *Phlyctenophora orientalis* (Brady, 1868)
Right valve, external view.
- 13-14. *Physocyprina* sp.
13, Left valve, external view; 14, right valve, internal view.
15. *Cyprinotus salinus* (Brady, 1868)
Left valve, external view.
16. *Cypridopsis vidua* (Muller, 1885)
Right valve, external view.

