TABLE I

Karyotype	2n	Meta-centric pairs	Submeta-centric pairs	Acro-centric pairs	Total biarmed pairs	X	Y	NF
Standard ..	46	2	9	11	11	sm	sm	66
Variant I ..	46	2	10	10	12	sm	sm	68
Variant II	46	2	8	12	10	sm	sm	66

chromosomes without change in the diploid number ($2n = 46$). The increase or decrease in the fundamental number (NF) in these two individuals appears to be due to pericentric inversions. In the variant with NF=68, the 21st pair (acrocentric) of the standard karyotype is assumed to have changed to a biarmed pair which fits in between 9th and 10th pairs (Fig. 1, Block I) and in the other variant with NF=64, the 9th pair (submetacentric) is converted into an acrocentric pair which falls between 20th and 21st pairs (Fig. 1, Block II). Such structural changes in the karyotype is of great significance because they are symptomatic of possible changes that the chromosomes could undergo without reproductive impairment. These could be floating chromosomal changes without any evolutionary significance but they signify the possible trends.

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MASS MORTALITY OF *LINGULA ANATINA* (LAM.) (BRACHIOPODA) IN PORTO NOVO WATERS, S. INDIA

Lingula anatina (Brachiopoda), the burrowing form inhabiting bottom muds is found from the mouth of the Vellar to the five fathom line in Porto Novo waters (29° 11′ N; 49° 72′ E). During the recent shore collections after the storm on 23rd November and again on 6th December, 1972, thousands of *L. anatina*, along with the tubiculous polychaete *Onuphis* sp., were found washed ashore for a mile in stretch in the intertidal area (Fig. 1) and most of them were fresh and healthy. The shore crab *Ocypoda macrocera* were found feeding on these dead specimens. Bottom samples collected from different depths contained only dead *Lingula*. The nature of the water was turbid and the surface water temperature, salinity, pH and oxygen values were 27·0° C, 14·5‰, 8·3 and 4·2 ml O_2/l respectively. The bottom salinity and oxygen values as drawn from previous year's data ranges from 14·6 to 15·2‰ and 4·2 to 4·5 ml O_2/l respectively. Phytoplankton and zooplankton collections were made and they were found to be exceptionally poor in the area.

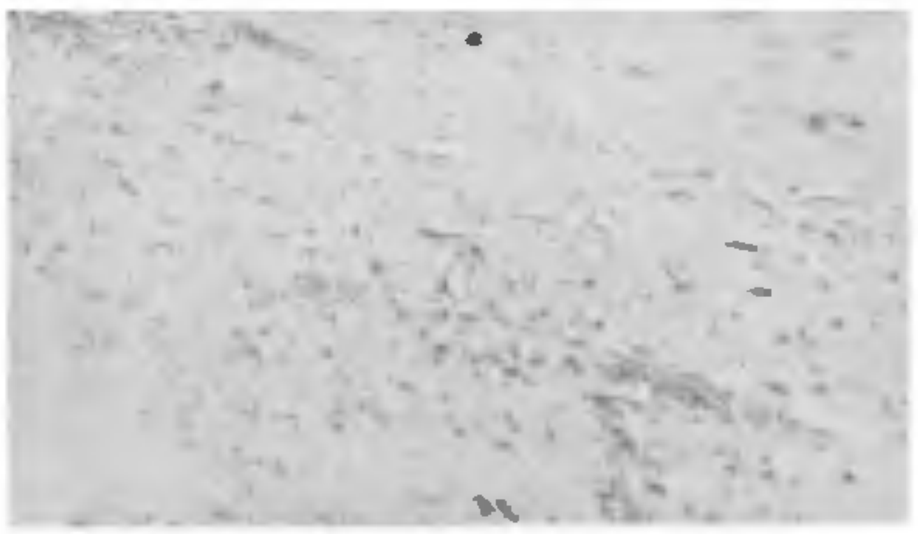

FIG. 1. Showing the mass mortality of *Lingula anatina* in the intertidal region.

The causes for the mass mortality among marine organisms are varied. Most of the Indian workers have attributed the noxious phytoplankton bloom as one of the reasons for the mortality of fishes. Such a phenomenon was never before noted in the case of *Lingula*. Two possible reasons may be given for the present mass *Lingula* mortality, viz., low salinity and cyclonic storms.

Due to low salinity.—According to Brongersma Sanders[1] mass mortality of marine organisms occur whenever there is a great inflow of freshwater due to heavy rains. When the north-east monsoon set in during October–December, freshwater inflow was very high in the Vellar River and due to this low salinity values ranging from 0–15‰ were recorded in the near-shore waters, when several factors coincided—rainfall, sudden influx of freshwater, etc. But this low salinity alone cannot be taken into account for the present mortality, since during previous monsoon periods also the same values were recorded.

Due to cyclonic storm.—From the weather forecast from Madras, in the night of 21st November and 22nd day and again on 6th December, 1972 severe cyclonic storm crossed the Tamil Nadu coast close to Cuddalore. This cyclonic storm combined with spring tide would have caused the large-scale death of *Lingula*.

Severe storms may cause great injury by covering the benthic fauna with layers of mud or sand or conversely benthic invertebrates are plowed from the bottom of the sea and thrown upon the beach[2]. During a severe gale in the Black Sea thousands of decapod crustacean *Upogebia littoralis* Risso which live in burrows were repeatedly cast on shore after storm[3].

The incidence of mass mortality of invertebrates in the Black Sea is of particular interest in view of similar occurrence recorded from other parts of the world. *Lingula* living in the bottom would have uprooted from their burrows by the agitation of water due to cyclonic storm and were cast on the beach. It seems likely therefore in the absence of other factors normally associated with mass mortality[1] that the contributory factor here is cyclonic storm and low salinity.

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INTRACELLULAR AND EXTRACELLULAR COMPLEMENT FIXING ANTIGENS OF JAPANESE ENCEPHALITIS AND CHANDIPURA VIRUSES IN MOSQUITO TISSUE CULTURES

ABSTRACT

Studies were undertaken to determine the intracellular and extracellular distribution of complement fixing (CF) antigens produced in *Aedes albopictus* (ATC-15) and *Aedes w-albus* cultures inoculated with different dosages of Japanese encephalitis (JE) and Chandipura (CHP) viruses.

The results indicated that in JE infected *Aedes albopictus* and *Aedes w-albus* cultures, CF antigens were found both in the extracellular medium and intracellular material whereas, in CHP inoculated cultures, the antigens were *retained mainly intracellularly.*

Cultures infected with a higher dose of CHP virus showed less complement fixing antigens indicating the tendency to develop prozone phenomenon. Such prozone phenomenon was not observed with JE infected cultures.

MOSQUITO tissue culture has been extensively used for studying the growth of arboviruses[1]. Pavri and Ghosh[2] detected complement fixing (CF) antigens in *Aedes albopictus* (ATC-15) cell cultures infected with dengue viruses; thus providing a simple method of identification of the type of virus involved. In their study, frozen and thawed culture fluids containing both intra- and extracellular viral antigens were employed in CF test and no attempt was made to determine intra/extracellular distribution of viral antigens separately.

This communication presents the preliminary results of distribution of CF antigens in *Aedes albopictus* and *Aedes w-albus* cultures inoculated with different dosages of Japanese encephalitis (JE) and Chandipura (CHP) viruses. Both JE and CHP viruses have been found to grow in *Aedes albopictus*[3,4] and *Aedes w-albus*[5] cultures.

The methods of preparation of cultures of *Aedes albopictus* (passage level 47) and *Aedes w-albus* (passage level 109) were essentially the same as described earlier[3]. Both JE (VRC No. P 20778; mouse passage level 16; titre 6·80 log mouse LD_{50}/0·03 ml for adult mice) and CHP (VRC No. 653514 mouse passage level 22; titre 7·75 log mouse LD_{50}/0·03 ml for adult mice) viruses were obtained from brains of infected baby mice as 20% suspensions in phosphate saline (pH 7·2) containing 0·75% bovalbumin and stored at — 50° C in sealed ampoules.

The cultures were inoculated with tenfold dilutions of JE and CHP virus stocks according to the method[3] described previously. The extracellular culture fluids were removed on the 4th PI day in