

SECTION D: LIFE AND EARTH SCIENCES.

SOME ASPECTS OF BACTERIAL ECOLOGY IN NEGOMBO ESTUARY

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Heterotropic bacterial population including bacteria involved in nitrogen transformation and faecal coliforms of Negombo estuary were studied. At the same time variation of dissolved oxygen, biological oxygen demand, chemical oxygen demand, concentration of nitrate, ammonia, pH temperature, salinity and rainfall data were also recorded.

Water samples were taken every two weeks from pre-selected sites of Negombo estuary for a period of 6 months. Heterotrophic bacterial populations were isolated by dilution plate technique, using tryptone soya agar and Zobell's medium. The bacterial flora involved in the four major steps of the nitrogen transformation and the coliforms were estimated by most probable number (MPN) technique using recommended media and methods.

The total viable counts were obtained by aerobic incubation, ranging from 3×10^2 to 4×10^6 in tryptone soya agar and from 18×10^1 to 15×10^6 in Zobell's medium. Twenty eight different species of bacteria were isolated. Most species were isolated in tryptone soya agar medium. Out of these bacterial species, 65% were found to be gram positive and 83% of this were found to be *Bacillus* sp. About 10 different species of *Bacillus* were recorded. *Staphylococcus* sp and *Bacillus* sp were the predominant gram positive species isolated. Among the gram negative isolates, *Pseudomonas*, *Klebsiella*, *Aeromonas* and *Vibrio* constituted the major groups.

Denitrifying and nitrogen fixing bacterial numbers were most numerous in low saline conditions and the number of nitrifying bacteria which were capable of converting nitrite to nitrate were found to occur in large numbers in extremes of high and low salinities. However, bacteria involved in the first phase of nitrification (i.e. conversion of ammonia to nitrite) could not be demonstrated. None of the *Bacillus* sp, isolated from the estuary, have the ability to utilize ammonia or urea as a nitrogen source.

MPN counts of faecal coliforms varied with the salinity of estuarine water.