International Journal of Scientific Engineering and Applied Science (IJSEAS) - Volume-1, Issue-9,December 2015
ISSN: 2395-3470
www.ijseas.com

MICROBIAL STATUS OF ANJANAPURA LAKE, BANGALORE, KARNATAKA

Latha, N and Ramachandra Mohan, M
Lake Management and Water Quality Research Unit
Department of Zoology, Bangalore University, Bangalore-560 056.

ABSTRACT

Microorganisms are cosmopolitan, diverse and distributed in openwater and sediments. In the present investigation, distribution of bacteria including pathogens in water and sediments of Anjanapura lake was studied. The study has found Total heterotrophic bacterial strains belonging to 13 genera (Escherichia, Pseudomonas, Vibrio, Aeromonas, Enterococcus, Cornybacterium, Salmonella, Klebsiella, Streptococcus, Staphylococcus, Flavobacterium, Micrococcus and Shigella). The genus Escherichia was dominated with 20% followed by Pseudomonas 15% and Salmonella 12%. Total Heterotrophic Bacteria population density varied in water samples from $2.8*10^4$ to $3.6*10^5$ CFU/mL and in sediment samples it varied from $4.3*10^5$to $5.2*10^5$ CFU/mL. The study is significant as it would pave way for future workers to elucidate the importance of lake sanitation, for keeping the environment clean.

Keywords: Pathogens, water, sediments and Total Heterotrophic Bacteria.

INTRODUCTION:

Microorganisms are cosmopolitan, diverse and distributed in open waters and sediments. Water ecosystems are governed by decomposition of organic matter to inorganic form and cycling of nutrients, mediated by microorganisms, which are responsible to sustain all the living things. Transformation of organic detritus through the mediation of microorganisms is now recognized as an important process in the water. Further, microbes are accountable for most of the benthic biomass and it is well known that they play a significant ecological and biogeochemical role in the water environment by regulating the transformation of major bioactive elements (i.e. carbon, nitrogen, phosphorus, oxygen and sulfur) and by affecting the degradability of organic matter. Water contamination in urban cities is due to discharge of urban wastes directly into waterbodies thereby cause human health problems, thereby a continuous monitoring of the water and sediments isnecessary to detect the presence of THB and pathogenic bacteria for the betterment of people. This will also help create public awareness on the health management for the people residing around waterbodies. In this context, present investigation focuses attention on THB and pathogenic bacteria occurring in both water and sediments of Anjanapura lake, Bangalore.

MATERIALS AND METHODS:

Sampling

Field collections were carried out in January 2005, in four stations. Surface water samples were collected in 100 ml sterile screw cap bottles for bacteriological assessment. Sediment samples were collected by employing an alcohol rinsed and air- dried small Peterson's grab. The central portion of the collected sediments was aseptically transferred into sterile polythene bags using sterile spatula. All samples were brought to the field in portable icebox within 4 hours. Immediately after arrival, inoculations were made using suitable media with necessary dilutions and pure cultures were established. ***Bacterial enumeration:*** Total heterotrophic bacterial (THB) population was enumerated by using spread plate method Plate count Agar. The plates after inoculation were incubated in an inverted position at a temperature of 28 ± 2°C for 24hours. After incubation, colonies in the triplicate samples were counted and expressed as colony forming units in water (CFU/ml) and sediments (CFU/mg). Bacterial colonies were picked out from the petridishes and restreaked in appropriate nutrient agar plates and pure cultures were stored in agar slants for further identification. Different morphological and biochemical characteristics of the isolates were studied according to the Bergey's Manual of Determinative Bacteriology.

Study area:

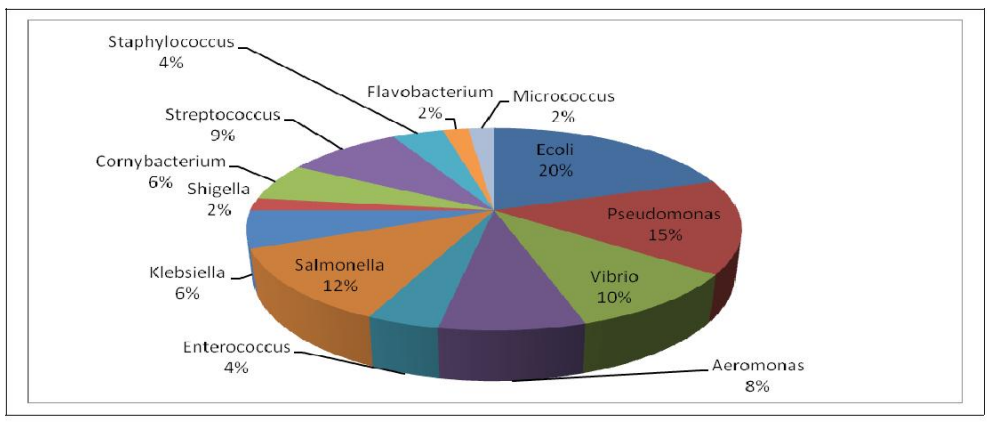
12^0 51\ 53\\ N latitude
077^0 33\ 33\\ E longitude

RESULTS:

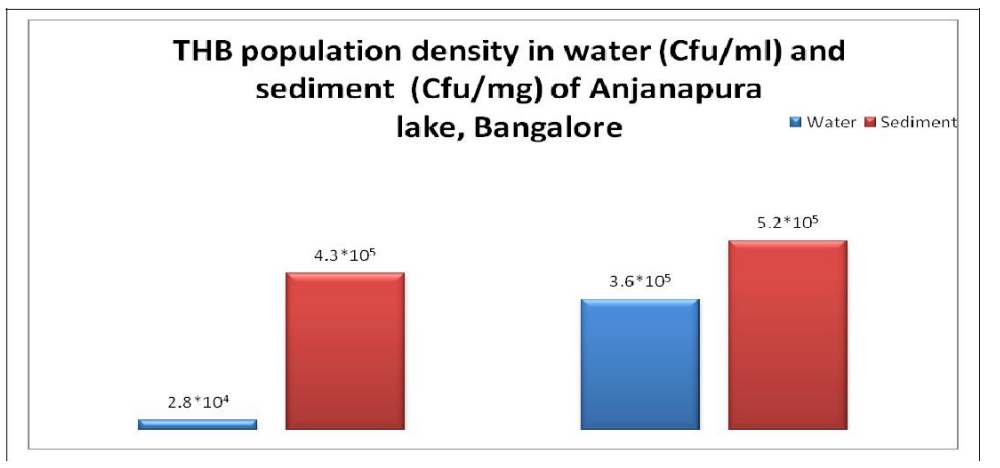
Generic composition of Total Heterotrophic Bacteria (THB)

A total of 13 genera [*Escherichia* (20%)*, Pseudomonas* (15%), *Vibrio* (10%) *, Aeromonas* (8%)*, Enterococcus* (9%)*, corynebacterium* (6%)*, Salmonella* (12%)*, Klebsiella* (6%)*, Streptococcus* (4%) *Staphylococcus* (4 %), *Flavobacterium* (2%)*, Micrococcus* (2%) and *Shigella* (2%)] were identified (Fig. 2) from 49 total heterotrophic bacterial strains, isolated from the water and sediment samples, 22 strains, were isolated from the water samples and 27 strains, were isolated from the sediment samples. In the water and sediment samples, gram negative bacteria were more (77%) as compared to the gram positive bacteria (23%).

International Journal of Scientific Engineering and Applied Science (IJSEAS) - Volume-1, Issue-9,December 2015
ISSN: 2395-3470
www.ijseas.com



Percentage composition of THB genera isolated from the water and sediment samples of the Anjanapura lake, Bangalore



CONCLUSION:

Present investigation highlights the occurrence of THB and pathogenic bacteria in the water and sediment samples, in Anjanapura lake Bangalore. THB and pathogenic bactera were more in the sediments than the water samples due to the rich organic content of the former and lesser residential time of the microorganisms in the water column than the sediments. In addition to the sediments retaining substantial amounts of naturally occurring organic matter such as sugars, amino acids, phenolic substances, lipids, polypepdides, polysaccharides and other constituents of living organisms especially sediment CO_2 and pH were favourable for microbial growth. Further, sediments play a significant role in the demineralization of organic matter which would enhance the microbial load in the sediments.

REFERENCES:

1.American Public Health Association, 1985: Standard Methods for the Examination of Water and Wastewater, 16th Ed. APHA, Washington, D.C.. American ..
2. Bergey's Manual of Systematic Bacteriology 2nd Edition. Published by Springer, New York.