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ORIGINAL RESEARCH ARTICLE

Identification and Enumeration of Pathological Organisms in Krishnagiri Reservoir, Krishnagiri District, Tamil Nadu, India

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ABSTRACT

In this present study, hydro biological characteristic features of the Krishnagiri reservoir Dam were investigated. The data for the present study were collected from 3 sampling stations for the period of 6 months in both premonsoon and monsoon seasons. Ten bacterial isolates were identified in different study area. The present study was aimed to enumerate the total *Escherichia coli*, faecal coliforms, *Pseudomonas* sp., *Aerobacter* sp., *Clostridium* sp., *Shigella* sp., *Vibrio cholerae*, *Vibrio parahaemolyticus*, *Staphylococcus* sp. and yeast. All this things keeping in the mind, the present study was carried out to detect the bacterial populations.

Key words: Reservoir Dam, Monsoon season, Premonsoon season and Bacteria.

1. INTRODUCTION

The loss or degradation of lakes can lead to serious consequences, including increased flooding; species decline, deformity, or extinction; and decline in water quality. These losses, as well as degradation, have resulted in greatly diminishing the lake resources across all continents of which the loss of fish diversity is conspicuous. Besides, lakes are also important as lentic reservoir for various species of plants including rice, which is a stable food for 3/4th of the world's population [1]. The spatial loss of lakes means broader ramifications to life on earth through loss in food chain links.

The quality of water flowing into lakes may be impaired indirectly, by alterations to the water regime or by different types of polluting activities. Pollution of inland waters is mainly due to the discharge of domestic sewage, industrial wastewaters and agricultural operations. Pollution can be classified as point source (emanating from an identifiable source) or non-point pollution (emanating from a diffuse source). The wastewater coming from point sources are easier to treat than that from non-point sources. The effects of diffuse pollutants are cumulative and can adversely affect lakes even at some distance. Lower quality results in degradation or destruction of lakes [2].

Decline in reservoir quality results in increased undesirable growth of weeds and algal blooms. When these algal blooms decompose, large amounts of oxygen are used up, depriving fish and other aquatic organisms of oxygen resulting in their death. The extraordinary productivity of water ecosystems means that many different stakeholders or users have easy access to and use of lakes resources. The overexploitation of these resources entails intense cropping, overgrazing, over fishing and excess hunting pressure. The cumulative impacts of these activities threaten biodiversity. Water plays an important role in the development of a country. In India, where majority of the population is agrarian, quantity and quality of aquatic resources play a major role in the ecological and economic sustenance of the people [3]. India is blessed with water resources in the form of numerous rivers and streams. By virtue of its geographical position and varied terrain and climatic zones, it supports a rich diversity of inland and coastal lakes.

2. MATERIALS AND METHODS

2.1. Sampling design

Totally three sampling sites were fixed to study about the hydrological features of Krishnagiri reservoir (i.e. physico-chemical and biological parameters) during four seasons Premonsoon

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Monsoon, post Monsoon and summer respectively period from June-2010-2011.

2.2. Collection of samples

To study the hydro biological features of Krishnagiri reservoir the samples were collected from three different zones.

2.3. Selection of sampling sites

Totally 3 sampling sites have been selected in this water body of which one is from east of the reservoir (road side) other one is west which collects municipal waste and the area 3 covers north of the dam where the human settlements is more situated on the south of the dam where normal human activities takes place.

Site: 1

This site is located on the east (road side) of the reservoir. This site is deep infested with a number of green algae particularly in all the seasons. Human activity at this site is limited to occasional bathing, cloth washing and the inlet areas where the chemplast industrial wastes are mixed into the dam. Water is drawn from this area for irrigation and gardening purposes.

Site: 2

It is the farthest site located at the north region of the water body. This site is used for fishing. At this site the human activity is the term of bathing, clothing, washing and fishing is common. There is an outlet to receive the domestic and run off.

Site: 3

It is located on the south side of the reservoir near this site where maximum bathing and cloth washing was observed. The water here was generally supplied for irrigation.

2.4. Analysis of Microbial parameters

To assess the microbial water quality of Krishnagiri reservoir, 100ml samples were collected and given for identification of microbes present in the water and soil sample. To evaluate the microbial quality of the dam water 100 ml of water samples were collected. Isolation and identification of pathogenic bacterial population studies were done by following the standard methods of [4].

3. RESULTS AND DISCUSSION

Totally 10 aerobic bacterial population was studied in water samples. Among the 10 bacterial population *Escherichia coli*, faecal coliforms, *Clostridium perfringens, Pseudomonas aeruginosa* and yeast and mould were found to be present in all the study area (**Table 1**) whereas Faecal *Streptococci, Staphylococcus aureus, Shigella dysenteriae, Vibrio cholerae* and *Vibrio parahaemolyticus* were found to be absent in the present study. The reason for the distribution of the plankton may be due to high temperature and pH of the soil and water samples [5].

As reported by others, the present study area soil is a highly heterogeneous ecosystem where conventional microbiological techniques only estimate a portion of the total number of bacteria [5]. Soil contains vast array of living cells in an organic or mineral matrix. Neither the living cells nor the composition of the inorganic / organic matrix are constant, both vary with time and location in nature. In the study area, *Escherichia coli*, coliforms, *Pseudomonas*, yeast and mould were observed. This anaerobic population presence showed the man made activities around the lake.

Biological hazards are concerned primarily with the entry of disease producing infectious agents into man's body. Communicable diseases may be transmitted directly from one person to another by direct contact or aerosols discharged by sneezing or otherwise, where the environment may be modified to break the route of transmission from one person to another. Such diseases may be prevented. Animal may be susceptible or the carriers of diseases which may be transmitted to other animals and some of these diseases may be transmitted to man in a manner similar to the transmission of communicable diseases from man to man. Diseases are also transmitted from person to person or from animals to man by means of other biological agents. In such cases, these agents are disease vectors. Among such diseases, vectors are flies, which may mechanical, when they puncture the skin for a blood meal and later infect the victim in a similar manner. In the case of the mosquito, however, part of the life cycle of the disease-producing organisms (as in malaria) may take place in the mosquito before another person may be infected [6]. Other common disease vectors include fleas, ticks, mites, cockroaches, etc.

Man is susceptible to invasion by worms which may produce dehabilitation or produce symptoms of disease. Such entry occurs through the ingestion of the eggs of the worms, or through penetration of the skin by the worms [7]. It is concluded from this study that *Vibrio cholerae, Staphylococcus, Vibrio parahaemolyticus* and yeast were found to be dominant in the stations II and III than the sampling station I. The presence of *Escherichia coli,* Faecal coliforms, *Pseudomonas, Aerobactor, Clostridium* and

Shigella are found to be fluctuated among the three stations.

Table 1: Microbial organisms recorded in the study area during 2010-2011

Name of the organisms	Station		
	1	2	3
Escherichia coli	068	036	153
Faecal coliforms	110	025	100
Pseudomonas sp.	030	064	092
Aerobactor sp.	090	060	055
Clostridium sp.	044	035	057
Shigella sp.	013	052	056
Vibrio cholerae	033	044	038
Staphylococcus sp.	030	042	031
Vibrio parahaemolyticus	013	018	015
Yeast	041	083	067

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