



ORIGINAL RESEARCH PAPER

Biological Science

A SELECTED STUDY ON DIFFERENT ECOLOGICAL PARAMETERS(TOTAL DISSOLVED SOLIDS-TDS,ELECTRICAL CONDUCTIVITY-EC,PH) OF PENDAL WADA RIVER AND PENGANGA RIVER BORDER OF MAHARASTRA STATE AND TELANGANA STATE, INDIA.

KEY WORDS: Pental wada, Penganga , Turbidity, Alkalinity, Conductivity, E.coli, Pistia,Eichhornia

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ABSTRACT

Present study on aquatic parameters of Pental wada river and Penganga river flowing near between Maharashtra and Tealangan states.The parameters that sampled for water quality include temperature, turbidity, conductivity, hardness, alkalinity, chlorides, fluorides, sulfates and E.coli bacteria. The paper has been explained also about various sources of pollution such as sewage discharge, industrial effluents and surface run off from agricultural land and their potential. It has been observed that abundance growth of floating hydrophytes like Pistia and Eichhornia on the water in Pental wada river. Contaminated water also effected the fish population and other aquatic animals. Finally, effect of aquatic pollution has been shown in brief.

INTRODUCTION

Hydrobiology is the study of the biology and physicochemical parameters of freshwater and interactions with the aquatic organisms for the benefit of man. The river Yamuna within Delhi is considered as the dirtiest river in India. According to official statistics, 351 floodplains associated with 323 rivers in the country are affected by pollution. In many places, the river water is becoming toxic, making it not suitable for drinking, even for bathing. As assessed by the scientists of the National Environmental Engineering Research Institute (NEERI) Nagpur, nearly 70% of water in India is polluted (Martin, 1998).

Bacteriological pollution was studied in river Ganga by Shukla et al. (1992) and in river Varuna by Shukla et al. (1988). Quality of sewage water entering the river Yamuna was studied by Sharma et al. (1981). Similar studies in river Mahanadi was conducted in Orissa (Patra et al., 1984). Physico-chemical properties of water of Hoogly estuary at various points was conducted by Basu (1966). It is a stark fact that there are many rivers in the country where the quality of water is deteriorating due to pollution.The Union Department of Environment, Forests and Climate Change has identified 13 rivers in 23 states that are affected by pollution.

The plight of rivers in Telugu states is so bad that pollution control boards have previously tested the water samples of Krishna and Godavari rivers and concluded that they are not fit for drinking. Alarm bells are ringing as Coliform bacteria are high in these. Many towns were developed along the banks of these rivers, and many industries sprang up. The wastes coming out from these are freely meeting in Krishna and Godavari rivers. In the above studies none of the rivers were reported to be pollution free. This is very distasteful to a country like India where rivers are considered sacred and worshipped.

MATERIALS AND METHODS:

Water samples were collected from sampling station in high grade plastic bottle and they were brought to the laboratory. Sampling was carried one time, during (August-September) season. Water analysis was carried out by following standard methods. The temperature was measured using a mercury filled centigrade thermometer on site. Cl - was also determined by titration method. Physical parameter i.e. pH was determined by digital pen pH meter, electrode which was calibrated as per instructional manual. The conductivity and total dissolve solid (TDS) was determined by the conductivity meter (Mettler Toledo MC-226 conductivity meter).Turbidity determined by Merck spectrophotometer (Spectroquant

NOVA-60), Fluoride determined by digital meter (Thermo Orion), electrode which was calibrated as per instructional manual. A simple and precise turbid metric method used for determining Sulphates. The Escherichia coli were detected by MPN method.

RESULTS AND DISCUSSION:

pH :

The observed pH values are ranging from 9.0 to 9.7 shows that the present water samples are alkaline in nature. The maximum permissible water pH limit prescribed by WHO is 6.5 to 8.5. The results obtained from analysis of water samples of rivers are shown in Table 1.

Total Dissolved Solids (TDS):

Total dissolved solids indicate the amount of chemical substances dissolved in the water. Total dissolved solids levels less than 500 mg/L are considered to be good. At increasing levels, palatability decreases. Levels in excess of 1000 mg/L may produce a bad taste. Water used for irrigation can vary greatly in quality depending upon type and quantity of dissolved salts. Water with TDS less than 450 mg/L is considered good and that with greater than 2000 mg/L is unsuitable for irrigation purpose. In the present study the value of total dissolved solids were found in Pental wada river water 344 mg/L and in Penganga river water 267 mg/L. The values are shown in Table 1.

Electrical conductivity (EC):

Water with EC less than 98.6 µs/cm is considered good and that with greater than 581 µs/cm is unsuitable for irrigation. The most influential water quality guideline on crop productivity is the water salinity hazard as measured by electrical conductivity (EC).The

Table 1. Hydrobiological characteristics of water from Pental wada river (S1) and Penganga river (S2) near to Maharashtra state and Telangana State in India.

S.No.	Parameters	Specification as per I.S.	Pental wada River and Penganga River (Sample-1&2)	
			S1	S2
1	Temperature	- oC	28.0	24.0
2	Turbidity	5-10 NTU	2	2
3	pH	6.5-8.5	9.70	9.00
4	Alkalinity	200-600 mg/L	252	232
5	EC	< 98.6 micro simian per	149	105

6	Chloride	250-1000 mg/L	36	42
7	Fluoride	1-1.5 mg/L	0.80	0.70
8	Sulphate	200-400 mg/L	22.72	19.2
9	TDS	500-2000 mg/L	344	267
10	E.coli	MPN method	ND	ND

S=Sample, EC=Electrical conductivity (micro simian per cm), TDS=Total dissolve solid andND= Not detected

primary effect of high EC water on crop productivity is the inability of the plant to compete with ions in the soil solution for water (physiological drought). The higher the EC, the less water is available to plants, even though the soil may appear wet. Because plants can only transpire "pure" water, usable plant water in the soil solution decreases dramatically as EC increases. In the present study the value of Electrical Conductivity (EC) for Pental wada river water is 149 µs/cm and Penganga river water is 105 µs/cm. The EC values of the water samples were a little bit more than the considerable values. The values are shown in Table 1.

Turbidity: Water colour and turbidity recorded to very low in both the rivers and found desired limit.

Chloride, Fluoride and Sulphate:

In the present study the values of Chloride, Fluoride and Sulphate were recorded to be very low in both the rivers and found desired limit. The values are shown in Table 1.

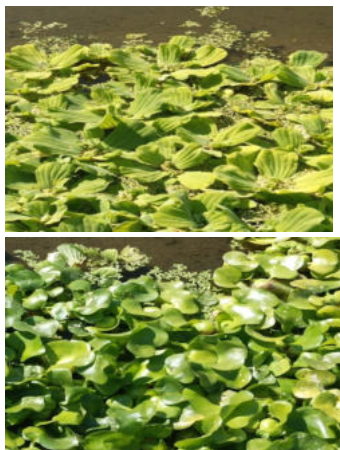
E.coli Bacteria: This bacteria was not detected in the water samples of the both the rivers.

CONCLUSIONS:

As these rivers flow between Maharastra state and Telangana state, the river water is polluted due to various harmful human activities such as sewage from surrounding houses, harmful chemicals from industries entering the river stream and various harmful pesticides due to agricultural activities. The effect of this pollution is harming the growth of many fish in the river. Abundant growth of floating aquatic plants like Pistia and Eichhornia in the Pental wada river indicates the water is polluted. They also pollute the river by dumping dead carcasses of dead animals into these rivers.

SUGGETIONS:

Like the 'Namami Ganga' project undertaken to clean the holy Ganga river, in other parts of the country, water purification centers should be established wherever necessary along with the removal of garbage accumulated on the surface of the water. People should be made aware of the need to protect the river by taking up biodiversity conservation, plant cultivation in the areas near the river. In order to prevent the pollution of rivers, the cooperation of the people along with the sincerity of the central and state governments is very necessary.



Growing of floating hydrophytes Pistia and Eichhornia in Pental wada river due to pollution



Bones of carcasses of dead animals in Pental wada river water

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