

Study on Physical and Biological Investigation of Water of Dardha River in Jehanabad Town (Bihar).

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Abstract: *Water is a prime natural resource, a basic human need and a precious natural asset. At present it has been the matter of global concern to think about the quality of water. To evaluate the extent of pollution, the physical and biological parameters of Dardha river water samples such as colour, turbidity, pH, biological oxygen demand (BOD) and total coliform counts (TCC) have been measured and discussed. The four sites along Dardha river in Jehanabad Town were selected for conducting the present study and it was observed that the sangam ghat was found to be more contaminated than the other sites.*

Keywords: *Dardha river water, colour, turbidity, pH, BOD, TCC.*

I. Introduction

The rivers are the most important sources to meet the demand of water for drinking, fisheries, agricultural and domestic purposes. However, the urbanization, rapid population growth, industrialization, religious and social practices etc, have threatened the rivers at the present time. The drains carrying the municipal sewage of Jehanabad Town enter into the Dardha river and affect the water quality.

The present study deals with the significant observations to monitor the suitability of Dardha river water (different sites) for safe drinking and other purposes at these sites through various water parameters such as colour, turbidity, pH, biological oxygen demand (BOD) and total coliform counts (TCC).

II. Materials and Methods

The standard methods were used for the analysis of water samples. The physical parameters such as turbidity was studied by using a turbidity meter, pH by pH meter and the biological parameters like BOD by incubating diluted samples at 25⁰C for 5 days in dark and TCC by multiple fermentation tube method.

The water samples were collected in plastic bottles from four different sites such as Dardha pool (site-1), Sangam ghat (site-2), Dr. Ajhar Hussain pool (site-3) and Aerodrome ghat (site-4).

III. Experimental

Colour:-The colour in water arises due to dissolved and suspended particles. The colour was measured by filtering the water samples to remove all suspended particles.

Turbidity:-The turbidity in water is caused by suspended solids like clay, silt and microscopic organisms. Higher the turbidity, higher is the risk of gastro-intestinal diseases. The normal limit of turbidity for drinking water is 5NTU. In the present study, turbidity has been found in the range of 1.5 to 7.2 (Table-1).

pH:-The pH is a numerical expression which is used to indicate the degree to which water is acidic or alkaline. The normal pH ranges for drinking water varies from 6.5 to 8.5 (WHO report). In the present study, the pH varies from 5.0 to 7.5 at different sites.

BOD:-Biochemical oxygen demand (BOD) is directly linked with decomposition of dead organic matter present in the water. It measures the oxygen in the water that is required by the bacteria & fungi (decomposers) for decomposition. Higher the BOD higher will be the water pollution. The permissible BOD level is <3mg/litre (WHO). In the present study, the BOD value varies from 9.0 to 13.5.

Total coliform counts (TCC):-The coliform bacteria (E.coli) are the causative agent of water born diseases like dysentery, hepatitis, typhoid, cholera and gastro-intestinal infections.

According to WHO, the bacterium E.coli should be 0/100 ml of water. In the present study all four sites showed bacterial contamination (Table-1), Which indicates that water of Dardha river is not safe for drinking purpose.

Table:-1 Physical and biological parameters of Dardha river water at Jehanabad (Bihar).

Parameters	Site-1	Site-2	Site-3	Site-4
Turbidity (NTU)	1.5	7.2	4.9	2.2
pH	6.0	5.0	5.0	7.5
BOD (mg/L)	9.0	13.5	12.0	9.0
TCC/100 ml	105	720	450	102

IV. Results and Discussion

The above table-1 shows the various results of physical and biological parameters of water samples collected from four different sites. Thus, the result, obtained from the present study have shown that the Sangam ghat and Dr. Ajhar Hussain pool (site-2 and site-3) were found to be more polluted than other two sites (site-1 and site-4). It may be due to the religious practices like dumping flowers, belpatras, fruits, coconuts, havan ashes and disposed sewage.

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