



**Study of physico-chemical analysis of flowing water of Bhima River in Solapur District
Maharashtra state India**

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Abstract

The present work is aimed at assessing the water quality the flowing water of Bhimariver in Solapur district. Flowing water samples are collected from Karmala, Madha, Malshiras, Pandharrpur, & Mohol of Solapur district. The samples are subjected for comprehensive physico-chemical analysis using standard method & analyse for Temperature, PH, Chloride, Sulphate, Alkanility, Dissolved Oxygen (DO), BOD, COD, Total Dissolved solid, Total Hardness, Calcium, Magnesium, , etc.

The study revealed that the Bhima river water in the area is not well within the permissible limit except some parameters. .All the parameter is co-related with one another & statistical analysis of the data is presented. The analysis reveals that flowing water of the area needs some degree of treatment before consumption & it also needs to be protected from the perils of contamination.

Keywords: Physico-chemical parameter, Bhima River, Water, Analysis.

Introduction

Water pollution is an acute problem in all India. Water is known to contain a large number of chemical elements. The interaction of both the physical & chemical properties of water play a significant role in composition distribution & abundance of aquatic organism. [1], Geographically Solapur District is located between 17.0 to 18.32 degree north latitude & 74.42 to 76.15 degree

longitude. The district is situated on south eastern. The major river in the district are Bhima & Sina river. The Nira river, Mann, river & Bhogawati, river are its tributaries.

The Bhima river is a major river in south India. It flows southeast for 861 kilometer (53mi) through Maharashtra Karnataka, & Telangana state before entering the Krishna river. After the first sixty five kilometer in a narrow valley through rugged terrain. [2], River water play an important role which provide water for commercial industrial domestic & agriculture purpose. The fresh water ecosystem is totally depends on the quality of water for the sustenance of its inhabitants. Bhima river is considered as life line for the inhabitants of the Solapur district in Maharashtra.[3], Due to increasing human interference the river water is in great threat of pollution. Therefore it is important to study the quality of water. Various physico-chemical parameter influence the potability of water. Initially human beings pollute the water through various activities & later for cleaning of this river water lot of money were spent. Nearly 80% Infectious disease are caused by water contaminants. So it is very important to provide clean water for people. Unfortunately water gets contaminated with impurities such as organic, inorganic contaminants & microorganism. [4], The present work is aimed at assessing the water quality the flowing water of Bhima river in Solapur district. Flowing water samples are collected from Karmala, Madha, Malshiras, Pandharpur, & Mohol of Solapur district. The samples are subjected for comprehensive physico-chemical analysis using standard method & analyse for Temperature, PH, Chloride, Sulphate, Alkalinity, Dissolved Oxygen (DO), BOD, COD, Total Dissolved solid, Total Hardness, Calcium, Magnesium, , etc.

Materials And Method

The water samples of Bhima river were collected from five different spots i. e. from Karmala Madha Malshiras Pandharpur & Mohol of Solapur district in polythene bottle of capacity 1 to 2 liter in winter season of year 2011. The water samples were analyzed to access the physico chemical parameters. The standard procedure were adopted for the determination of physico- chemical parameter given by APHA (1989) & Trivedy & Goel (1986). Each sample was analyzed for important physico- Chemical parameter such as Temperature, PH, Chloride, Sulphate, Alkalinity, Dissolved Oxygen (DO), BOD, COD, Total Dissolved solid, Total Hardness, Calcium, Magnesium, , etc.

Result and Discussion

The physico- chemical analysis of Bhima river water is given in Table 1. Temperature is basically important for its effect on certain chemical & biological activities in the organism attributing in aquatic media. In the Indian subcontinent the temperature in most of the

bodies range between 7.8 to 38.5°C. [5], The water temperature range between 27°C to 30°C in all the spot sample. The variation is mainly related with the temperature of atmosphere & weather condition.

The PH values of water bodies (river) found in alkaline side (PH>7). The PH values of all sample ranges from 7.10 to 8.62. In general the PH values are higher in winter than other season. The variation can be due to the exposure of water to atmosphere biological activities & temperature changes. [6],

Alkalinity is imparted by salts like carbonate bicarbonate nitrates. [7], The alkalinity ranged between 340 to 425 mg/lit, with maximum being at Phandharpur. High chloride level indicates pollution from domestic sewage. Chloride were found maximum at Mohol. The sulphate concentration in the water were very high ranging between 50.6 to 190.8 mg/lit. The source of sulphate could probably be from the mineral rocks anthropogenically added & also enter with rain. [8], Dissolved oxygen (DO) is one of the important parameter in water analysis. It reflects the physical & biological processes prevailing in the water. Non polluted is normally saturated with DO. [1] The dissolved oxygen was found maximum at Karmala (13.06 & minimum at Madha (4.59).

Biochemical oxygen demand (BOD) is the amount of oxygen required by the bacteria in stabilizing the decomposable organic matter. The BOD range from 1.45 to 3.42. High concentration of BOD was recorded at Mohol (3.42) is due to huge load of sediments & sewage water.

Chemical oxygen demand (COD) is the amount of oxygen consumed during the chemical oxidation of organic matter using strong oxidizing agent like acidified potassium dichromate. The COD is linked with the heavy pollution from paper industries domestic sewage & Industrial effluents on the bank of river. In present study COD ranges from 11.2 to 21.4 mg/lit. The highest value of COD indicate the most of the pollution caused by industrial effluents upstream. Similar results were also reported by Pande & Sharma. [9],

In present study total hardness (TH) ranges from 192.8 to 459.2 mg/lit. It is maximum at Madha & minimum at Malshiras. These finding suggest that the water body of Bhimariver is very hard. Although hard water has no known effect on health but it is unsuitable for domestic use. It also forms heat insulating scales in the boiler reducing their efficiency. [10], As regard to total dissolved solids (TDS) the BIS (1991) maximum permissible limit is 1500 mg/lit. for drinking water. The of the TDS in the study area ranges from 260.6 to 310.2 mg/lit. which are well below the maximum permissible limit as mentioned above. [11],

In the present analysis calcium ranges from 60.0 to 165.3 mg/lit while magnesium ranges from 35.3 to 86.5 mg/lit. The calcium & magnesium are exceeds than the desirable limit.

The physico- chemical analysis of flowing water of Bhima river in Solapur district (M. S)It was concluded that river water get polluted as maximum parameter are not in the permissible limit & this condition arise due to the local anthropogenic activity agriculture runoff & due to the industrial effluent. So if untreated sewage continuously get discharged into the river then potable nature of Bhima river will be lost. River water is potable after proper treatment. However monitoring is important to detect drinking water contamination.

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Table 1 Physico- Chemical Analysis OfBhima River

Parameter	karmala	Madha	Malshiras	Pandharpur	Mohol
Temp. (C°)	27	28	27	30	29
PH	7.25	7.13	7.52	8.62	7.10
Alkalinity (mg/lit.)	360.0	411.0	340.0	425.0	380.0
Chloride (mg/lit.)	140.20	80.0	168.40	220.12	50.50
Sulphate (mg/lit.)	85.50	50.60	19.80	65.40	75.0
Dissolved Oxygen (mg/lit)	13.06	4.59	9.66	10.50	8.77
BOD (mg/lit)	1.45	3.14	3.77	2.03	3.42
COD (mg/lit.)	14.40	19.50	11.20	26.80	21.40
Total Hardness (mg/lit.)	266.20	459.20	192.80	320.30	432.70
TDS (mg/lit.)	310.20	270.50	280.80	260.60	295.90
Calcium	60.0	78.10	108.50	165.30	146.20
Magnesium	72.60	35.30	58.40	70.90	86.50

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