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## EFFECT OF MICROORGANISM AND ESTIMATE THE WATER QUALITY FROM BILASPUR AREA, CHHATTISGARH, INDIA

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### ABSTRACT

Potable Water must be free from all types of micro-organism, because micro-organisms are responsible for various king of disease. In Present study, quality of Drinking Water, were determined in June-September 2016 from four different locations (S1, S2, S3 and S4) in Bilaspur Chhattisgarh, India. The result showed that in Water of this area contain low Dissolved Oxygen which is not suitable for aquatic animals. And reported that the some Water Quality parameters BOD, COD, Calcium, Magnesium and Total Dissolved Solid was found to be high. And also reported the value of TBC (Total Bacterial Count) found to be high range from 85 to 130 cfu/ml.

**KEY WORDS:** Micro-organism, Potable water and Water Quality Parameters.

### INTRODUCTION

Pollution parameters have been classified as physical, chemical and biological on the basis of analytical tests. Physical parameters include temperature, turbidity, colour, suspended and floating matter etc. Chemical parameters include organic and inorganic dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), pH, alkalinity, chlorides, Hardness etc. Biological parameters include Total bacterial population, coliform etc, for evaluating water quality from a large number of samples, each containing concentrations for many parameters is difficult. Potable water is the water that is free from disease producing micro-organisms and chemical substances.

The scarcity of clean and potable drinking water has emerged as most serious environment issue of the twenty first century. Water resources are of great environmental issues and studied by a wide range of specialists including hydrologists, engineers, ecologists, geologists and geomorphologists. The number of industries in India, during the last decade has grown more than ten times and accordingly the problems related to environmental degradation have increased many folds. There is a need for sustainable development of economic growth and industries. Some of the industries release their

effluents either on the open land or in surrounding surface water bodies contaminating the soil, surface water and ultimately ground water. Government of India is aware of these problems and has started looking into the remedial measure to clean some of the highly contaminated surface water bodies. Involvement of very high costs of remediation will make this process slow and therefore, it is essential that the contamination of water bodies is controlled rather than remediation. It is difficult to understand the biological phenomenon fully because the chemistry of water reveals much about the metabolism of the ecosystem and explain the general hydro - biological relationship (Patil. et al. 2012)

### Study Area

The water sample was taken from Bilaspur, Chhattisgarh India. Bilaspur is a famous city of Chhattisgarh, India and large number of populations is live here.

### Water Quality Parameter

The water sample was analyzed in the laboratory of Dr. C. V. Raman University, Bilaspur. And determine the some Water Quality parameters such as pH, Temperature, Turbidity, Total Hardness, Calcium, Magnesium, Total

Dissolves Solid (TDS), Total suspended solids, Chloride, Fluoride, Dissolved Oxygen (DO), Biochemical Oxygen demand (BOD), COD and Sulphate by using standard methods. Biological parameters like TBC also determined by standard method. The Standard Chemicals and reagents use for detection of this parameters and Distilled Water used for Preparation of Standard Solutions.

#### MATERIAL AND METHODOLOGY

The water sample was collected in June-September 2016, from Four Different locations (S1, S2, S3 and S4) in

Bilaspur, Chhattisgarh India. Sample collect in plastic bottle and immediately transported to the laboratory and avoid any changes in Water quality parameters.

All parameters determined using standard methods. pH measured by pH meter using standard solutions; Total Hardness determined by EDAT method; Turbidity measured by turbidity meter; TDS measured by TDS meter; Dissolved Oxygen determine by DO meter; BOD analyzed by using BOD incubator; COD determined by titration method; and TBC determined by Standard Plate Count Methods.

**Table1. Analysis of Water Quality from different locations in Bilaspur Area, Chhattisgarh, India.**

S. No.	Parameter	Unit	S1	S2	S3	S4
1.	pH	-	7.2	7.0	7.2	7.6
2.	Temperature	°C	28.6	27.9	28.4	27.9
3.	Turbidity	NTU	35	32	35	36
4.	Total suspended solids	mg/l	20	15	18	20
5.	Total dissolved solids	mg/l	458	379	388	512
6.	Dissolved Oxygen	mg/l	4.5	5.3	4.5	5.9
7.	BOD - 3 days, 27°C	mg/l	2.8	3.0	2.9	2.6
8.	COD	mg/l	17	14	12	14
9.	Calcium (as Ca)	mg/l	190	204	130	200
10.	Magnesium (as Mg)	mg/l	160	100	80	160
11.	Chloride (as Cl)	mg/l	95	80	110	105
12.	Fluoride (as F)	mg/l	0.2	0.1	0.2	0.1
13.	Sulphate (as SO <sub>4</sub> )	mg/l	80	70	70	75
14.	Total Bacterial Count(as TBC)	cfu/ml	130	85	120	105

**Figure 1. Map of state of Chhattisgarh located in India and also show Bilaspur Area sample of water collect from this place.**



#### RESULTS AND DISCUSSION

All the observed value Water Qualities parameter is showed in the table-1. The value of pH found to be 7.0 to 7.6 and this values are permissible according to WHO, Turbidity found to be 32 to 36 NTU, this values directly

showed the high contaminated in water sample. TDS value are within the permissible range except S4 sample which has high TDS 512 ppm. Dissolved Oxygen found to be 4.5 mg/l in S1, which not suitable for Aquatic animals, Chloride

found to be 80 to 110 mg/l, BOD value found to be high 2.6 to 3.0 mg/l and COD also found in high level 12 to 17 ppm. Value of Calcium and Magnesium found to be high as compare to acceptable value. And TBC ( Total Bacterial Count) found to be 85 to 130 cfu/ml.

### CONCLUSION

In drinking water micro-organisms can cause sensory defects (odour, colour, taste) Micro-organisms are an important cause of the corrosion of steel pipes. Various health related problems due to contaminated waters are

diarrhoea abdominal cramps and vomiting due to salmonella cholera is due to mycobacterium. TBC found to be high so before using water for any purpose should be minimize value of TBC. And other water quality parameters like Ca, Mg, BOD and COD also found to be high in water sample from Bilaspur area.

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### CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

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