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Assessment of Water Quality - A Case Study of Umarkhed Area

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ABSTRACT

A study of physico-chemical and microbial properties of water sample is done in the regions of Umarkhedtehesil of district Yavatmal state Maharashtra. Some water samples were collected from different regions having different sources and physico-chemical properties were analyzed like hardness, TDS, pH, conductivity, Chloride, Sulphate, D.O. & C.O.D etc. The MPN count resulted from the bacteriological study of these samples has given the information regarding the suitability of the water for drinking and other domestic applications. The results are studied comparatively and conclusions regarding the use of such waters are made.

Keywords: COD, DO, TDS, Physico-chemical properties

I. INTRODUCTION

Water is a very important part of our life and it plays vital role in our, animals, and in plants life. Due to the urbanization and industrialization it effects on spoilage of the water. For the agriculture purpose farmers use ground water in rural areas and mainly where there is lack or dam, river or a canal. In few years it is observed that the ground water get polluted due to increased human activities in nature [1,2], so that's why water born diseases has been increased that effects very badly [3,5.6]. So, basic monitoring on water quality is necessary to reduce the pollution level of ground water and make it safe and clean [4]. Some of water sample analyzed. The present work is an try to see the water quality of various water sources *viz.* ground water at patilnagar, ground water at nathnagar, tape water, painganaga river water in Yavatmal district. All the samples where college in the month of June 2021, and all the samples were collected in sterilised bottle. The procedure is done by Standard method of analysis of water and waste water [11]

II. MATERIAL & METHOD

Water sample were collected in clean and dry sterilised bottle of one liter capacity. Sample are collected from different sources (bore well, well, hand pump). P^H, conductance, TDS, Sulphate, Chloride, D.O. and C.O.D etc are by kit and TH is determined by complexometric titration. Color, odour, temperature were determined at

the point of sample collection. Observed value for different parameter has been compared with standard specified by world health organization (WHO) and Bureau of Indian standard (BIS).

III. RESULTS AND DISCUSSION

The physical, chemical parameters exhibited with variations from sample to sample. All the process were carried at temperature 26^{0}C The observations are in the table shown below.

Sr. no	Parameter	Sample 1 Patil nagar	Sample 2 Nath nagar	Sample 3 Borban	Sample 4 Shrinagar	Sample 5 Penganga River	Sample 6 Mineral water
1.	Temperature ^{0}C	26	26	26	26	26	26
2.	pH	7.5	7.1	7.3	7.2	8.2	7.5
3.	TDS, mg/L	123	214	176	264	492	44
4.	Ca hardness mg/L	114	116	112	204	141	25
5.	Mg hardness mg/L	41	43	44	104	66	12
6.	Total hardness mg/L	155	160	155	310	204	37
7.	Chloride mg/L	76	97	86	204	71	17
8.	Sulphate mg/L	34	46	43	88	54	23
9.	D.O mg/L	7.2	5.6	6.8	5.6	5.5	7.2
10.	C.O.D mg/L	10.6	11.5	10.7	12.8	14.1	02
11.	E.C mho/cm	1224	1180	1182	830	1290	180
12.	Coliforms/100ml	260	320	270	370	480	Nil

On the basis of above chart the , following observations are made, it is seen that the pH of the water was slightly alkaline (7.2 to 8.3) and only minor changes in pH was observed . The pH levels of most of the samples were within the permissible limits for domestic use as given by APHA [11]

The WHO has given a limit of value of 500mg/L for TDS, potable water. In the present work this limit is not crossed on either side by any of the samples. In the Sample-6, the TDS value is about to reach the maximum limit. These values are good for domestic use and agricultural purposes. The total amount of calcium hardness and magnesium hardness is said as the total hardness of water. In the observation, it has been observed that the calcium concentration is at least two folds greater than that of magnesium. The limiting values prescribed by ISI are much less than reported. Presence of anions like chloride and sulfate is also seen in the water samples. It has been observed that much amount of sulfate in drinking water leads to diarrhea. Here it is observed that the sulfate concentration in the samples fall well in given limit but the chloride content is much greater than the given values by WHO and ISI. Dissolved oxygen present in drinking water adds taste. In this study dissolved oxygen content varies in a range of 5.6 to 7.2. The higest given value of chemical oxygen demand (COD) is 10 mg/L for drinking water. The present samples have registered a range of 10 to 14 mg/L. Most of the water samples contain some amount organic matter that gives nutrition for the growth and multiplication of microorganisms.

IV. CONCLUSION

From the present work we conclude that the quality of water samples subjected to study was acceptable from majority of physico - chemical parameters while as per the bacteriological standards, the water needs to be treated before using it in domestic uses. So as far as sample waters are concerned the risk of getting infected by water borne diseases is there if used without disinfections. The water can be used after practicing suitable disinfections system. The mineral water is to be safe for drinking purpose

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