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### **Research Articles**

#### PHYSICOCHEMICAL ANALYSIS OF DRINKING WATER OF MUNICIPAL CORPORATION AREA OF REWA (M.P.) IN SUMMER SEASON

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### **ABSTRACT**

Fresh water is a critical, finite, vulnerable, renewable natural resource on the earth and plays as important role in our living environment without it life is impossible. Three samples from different places around Ranitalab were collected in February to May 2017 and analyze for different physico-chemical parameters such as temperature, conductivity, pH, TDS, turbidity, chloride, total alkalinity, hardness, calcium, magnesium and iron. The analysis of various parameters carried out using standard methods (APHA) and then compared with the standard guideline values.

Keywords: Water, Physico-Chemical Parameters and Ranitalab.

### **INTRODUCTION**

Water is one of the most important and abundant compounds of the ecosystem. All living organisms on the earth need water for their survival and growth. As of now only earth is the planet having about 70% of water. But due to increased human population, industrialization, use of fertilizers in the agriculture and man-made activity it is highly polluted with different harmful contaminants. Therefore it is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varied of water borne diseases. (1)

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The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life. Natural water contains different types of impurities are introduced in to aquatic system by different ways such as weathering of rocks and leaching of soils, dissolution of aerosol particles from the atmosphere and from several human activities, including mining, processing and the use of metal based materials. (2)

The surface and underground water sources are becoming inadequate to fulfill the potable water needs of the residents of townships. The potable water problem has been further aggravated by the surface water pollution caused by the industrial, municipal, domestic sewage, urban runoff and farmland runoff etc.

Present investigation is aimed at investigating and assessing the drinking water with special reference to Quality status in Municipal corporation area of Rewa for safe drinking purpose. During the investigation, Ranitalab was selected. Keeping the aim of study monthly sample from Feb. 2017 to May 2017 was taken. At least three water samples were collected every month and analyzed accordingly from the each station.

#### **MATERIALS AND METHOD**

The Rewa district is located between 81-15. East longitude and 24-42 North latitude and is situated on the Vindhya Plateau at the height of 318 m above MSL. Rewa is synonyms of holy river Narmada. Narmada flows in a larger part of Rewa-Khand hence the name Rewa was adopted. The town is situated on the confluence of Bihar and Bichhia River.

Rewa plateau is a part of major Vindhyan basin, which lies amidst the vast hilly expanse of Central India (3). The area receives about 1100 mm annual rainfall mainly from the southwest monsoon and enjoys subtropical to humid climatic condition. The temperature goes up to  $43^{\circ}$ C in summer and  $4^{\circ}$ C in winter season.

Water samples have been collected from different three stations A, B, and C. The water samples were collected in stenciled bottles (polyethylene bottles). The test for pH, turbidity, water temperature, hardness and alkalinity has been carried out using multi functional water.

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#### **RESULTS AND DISSCUSION**

Water being the vital element of life, maintenance of a good water quality is highly essential for human wellbeing. Ground water has several applications in the field of cooking, domestic uses, industrial applications, agricultural utility and many more. Due to its purity and rich nutrient and mineral contain, ground water is preferred as a major source in the form of purist form of water (4).

Water temperature is an important parameter for any aquatic ecosystem by its value of influence on aquatic life directly or indirectly. The temperature of the water samples collected from Ranitalab showed minimum 21.53°C in the month of April at station A and maximum 31°C in May at station C respectively. The minimum Secchi depth in Apr. 2017 at station C could be attributed to the turbidity caused by run-off water from the catchment area. The high values of Secchi depth during Feb. 2017 all stations at Ranitalab.

Conductivity is related to the concentration of ions present in water. According to Welch (1952) (5) the seasonal fluctuations in this factor were caused mainly by variations in the ionic precipitation and the diluting effect of rains. It was observed that the value of conductivity was minimum (285.25 micro mhos/cm) in Feb. 2017 at station B. The values of conductivity at all stations did not remain static but kept on increasing with the change of month. The pH ranged from 7.20 to 8.85.

In the present study period dissolved oxygen values ranged from 5.56 to 10.3 mg/l. similar results were reported of some water ponds of Ayodhya (6). All the three station showed little difference, with respect to availability of dissolved oxygen, during the investigation period. The abundance of carbon dioxide exerts certain specific effects on aquatic biota. The free CO2 content of the water ranged between 0 to 10.00 mg/L. The average values of Free CO2 were found to be maximum (10.00 mg/L) in April at station B.

The high value of alkalinity indicates the presence of weak and strong base such as carbonates, bicarbonates and hydroxides in the water body. The total alkalinity was found to

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be least (114.41 mg/L) in the water samples taken at station A in Apr. 2017. It was at its peak (147.31 mg/L) in May 2017 at station A at Ranitalab.

The estimation of B.O.D. is an important measure to the oxygen required for the biodegradation of organic matters present in water. During the present study the minimum average value of BOD (4.4 mg/L) was observed in March 2017 at station A and was maximum (7.7 mg/L) in water samples collected from Ranitalab in May 2017 at station B. During the present study the minimum average value of COD (17.1 mg/L) was observed in Feb. 2017 at station B and was maximum (20.8 mg/L) in water samples collected from Ranitalab in May 2017 at station B.

In general, water with total solids content less than 500 mg/l are most desirable. WHO in 1973 sets the international standards of permissible limit for dissolved solids as 500 mg/l and the excessive limit as 1500 mg/l. The water of Ranitalab may be considered in case of total solids under the desirable limit for drinking and bathing water quality. The total hardness (210.72 mg/L) was at its peak during May 2017 at station B. The total hardness was least (144.32 mg/L) in Feb. 2017 at station B.

The values of Calcium were highest (190.72 mg/L) in April 2017 in the case of samples collected from the station A. It was found to be least (105.0 mg/L) at station B. Wetzel, (1975) (7) Magnesium is main constituent of autotrops. It is required universally by chlorophyllous plants as the magnesium prophyrin component of chlorophyll molecules, and as co-factor for various enzymatic transformations in the cell. Magnesium content of study sites vary with a narrow range during the observation period. Its concentration was maximum (22.96 mg/L) in May at station B water samples, while it was least (5.15 mg/L) at station C.

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Table 1 – Parameters of water analysis of Ranitalab from February 2017 to May 2017

Parameters	Station – A		Station – B		Station – C	
	Max.	Min.	Max.	Min.	Max.	Min.
Temperature ( <sup>0</sup> C)	28	21.53	30	22.84	31	22
Transparency (cm)	50.21	25.57	50.32	25.52	51.12	25.18
Conductivity(µmhos/cm)	390.32	285.51	391.51	285.25	392.52	287.32
pН	8.63	7.25	8.85	7.20	8.81	7.31
DO (mg/l)	9.7	5.56	8.9	6.32	9.2	7.4
Free CO <sub>2</sub> (mg/l)	6	0	10	4	7	2
Total alkinity (mg/l)	147.31	114.41	144.21	116.31	143.21	115.23
BOD (mg/l)	7.6	4.4	7.7	4.5	7.5	4.6
COD (mg/l)	20.8	17.5	20.6	17.1	20.4	17.4
Total dissolved solid	126.11	96.73	128.23	97.52	129.42	95.31
(mg/l)						
Total hardness of water	186.21	150.21	210.72	144.32	200.25	170.37
(mg/l)						
Ca – hardness (mg/l)	190.72	130.20	180.71	105	176.21	136.50
Mg – hardness (mg/l)	13.78	6.24	22.96	9.19	16.59	5.15

#### **CONCLUSION**

The above study concluded that the ground water sources near by the municipal corporation of Rewa are getting less contaminated. All samples are of safe and marginal types. So it can be concluded that groundwater of the area is suitable for drinking after treatment.

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