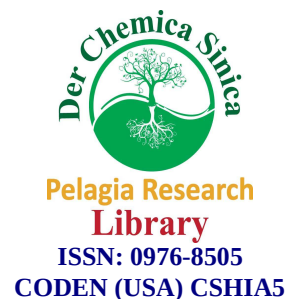




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Physico-chemical characteristics of bore wells drinking water of Kathalal territory district-Kheda, Gujarat

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ABSTRACT

Physico-chemical analysis such as temperature, pH, dissolved oxygen, total dissolved solids, chloride, total alkalinity, calcium and magnesium hardness, sulphate, phosphate nitrate of bore wells water was carried out from twenty sampling station of kathalal territory area during the February-2011 in order to assess water quality index.

Key words: Physico-chemical analysis, kathalal, complexometric, sulphate.

INTRODUCTION

In continuation of our earlier analysis on bore wells water [1-3], here we report the Physico-chemical analysis of bore wells drinking water of kathalal territory. kathalal is located in kheda district of Gujarat. bore wells water is generally used for Drinking and other domestic purposes in this area. The use of fertilizers and pesticides manure, lime, septic tank, refuse dump, etc, are the main sources of bore wells water pollution[4] in the absence of fresh water supply, people residing in this area forced to use bore wells water for their domestic and drinking consumption. In order to assess water quality index, we have carried out the Physico-chemical analysis of bore wells drinking water.

MATERIALS AND METHODS

In the present study bore wells water sample from twenty difference areas located in and around kathalal territory were collected in brown glass bottles with necessary precautions

Physico-Chemical analysis

All the chemicals used water of AR grade. Double distilled water was used for the preparation of reagents and solutions. The major water quality parameters considered for the examination in this study are temperature PH ,dissolved oxygen (DO)total dissolved solid(T.D.S),total alkalinity, calcium and magnesium hardness, sulphate, phosphate and nitrate contents[6].

Temperature pH, dissolved oxygen (DO) total dissolved solid (T.D.S), phosphate, Nitrate values were measured by water analysis kit and manual methods. Calcium and magnesium hardness of water was estimated by complexometric titration method [4,5]. Chloride contents were determined volumetrically by silver nitrate titration method using potassium chromate as an indicator. It was calculated in terms of mg/L. sulphate contents were determined by volumetric method [5].

RESULTS AND DISCUSSION

The Physico-chemical data of the bore wells water samples collected in February -2011 are present in table respectively. The results of the samples vary with different collecting places because of the different nature of soil contamination [6].All metabolic and physiological activities and life processes of aquatic organisms are generally influenced by water temperature.

Temperature.

In the present study temperature ranged was kept from 29.4^oc to 34.3^oc.

PH

In the present study PH ranged from 6.9 to 8.3 which lies in the range prescribed byAPHA¹. The pH value of drinking water is an important index of acidity, alkalinity and resulting value of the acidic basic interaction of a number of its mineral and organic components. pH below 6.5 starts corrosion in pipes. Toxic metals which are present in water increase the pH value of water. The tolerance pH limit is 6.5 to 8.5.

TDS:

In the present study TDS ranged from 185 mg/l to 1380 mg/l. according to WHO and Indian standards. TDS value should be less than 500 mg/l for drinking water. All the sample station except sample station no 14 higher ranged as prescribed by WHO and Indian standards[7,8].

D.O.

In the present study dissolved oxygen (D.O) ranged from 6.4 mg/l to 10mg/l. The minimum tolerance range is 4.0 mg/l for drinking water.

Chlorides:

The chlorides contents in the samples between 28.48mg/l to 285.40 mg/l natural water contain low chloride ions. In the present study sample No.7 shows 315.75 mg/l chloride which is highest value in twenty different sampling stations. The tolerance range for chloride is 200 to 1000mg/l.

Total Alkalinity:

In the present study total alkalinity range was from 148 mg/l to 856 mg/l.

Calcium Hardness:

The calcium hardness range is from 8.02 mg/l to 144.3mg/l. The tolerance range for calcium hardness is 75 to 200 mg/l. Calcium contents in all samples collected fall within the limit prescribed. Calcium is needed for the body in small quantities, though water provides only a part of total requirements.

Magnesium Hardness:

Magnesium hardness ranged from 19.44 to 182.74 mg/l. The tolerance range for magnesium is 50 to 100 mg/l.

Sulphate:

Sulphate ranged from 19.41 mg/l to 384.30 mg/l. The tolerance range for sulphate is 200 to 400 mg/l. The high concentration of sulphate may induce diarrhea.

Phosphate:

In the present study phosphate ranged from 4.0 mg/l to 42 mg/l. The evaluated value of phosphate in the present study is much higher than the prescribed values.

The higher values of phosphate are mainly due to use of fertilizers and pesticides by the people residing in this area. If phosphate is consumed in excess, phosphine gas is produce in gastro-intestinal tract on reaction with gastric juice. This could eve lead to the death of consumer.

Analysis result of the sample collected in February-2011.

No.	Sample Station	TempC	pH	TDS	D.O. m/l	Chloride mg/L	Total Alkalinity mg/L	Ca Hardness mg/L	Mg Hardness mg/L	SO ₄ ⁻² mg/L	PO ₄ ⁻³ mg/L	NO ⁻³ mg/L
1.	Jamni	30.5	7.5	200	7.6	27.67	328	35.13	68.45	345.84	8.5	50
2.	Sarali	30.7	7.62	800	8.5	78.65	486	26.15	73.26	236.45	2.5	150
3.	Pithai	31.3	8.01	350	6.7	43.35	525	27.56	45.36	119.65	5.5	260
4.	Abhripur	31.6	7.13	410	6.3	85.64	373	52.39	88.14	84.59	6.5	350
5.	Bagdol	29.8	7.4	560	7.5	110.36	416	43.78	19.26	159.36	3.5	210
6.	Chhipadi	29.4	7.05	380	6.7	92.35	629	17.23	76.94	324.74	4.5	105
7.	Bhaner	30.5	6.85	480	8.1	115.68	548	8.02	12.84	72.36	7.0	120
8.	Bhatera	30.9	7.62	980	7.8	98.37	360	28.85	29.64	38.64	15.0	70
9.	Chelavat	31.8	7.25	710	7.4	83.47	338	33.46	27.39	276.41	10.0	125
10.	Kakarkhad	31.3	6.5	185	6.8	145.10	624	72.68	64.22	165.95	12.0	235
11.	Manor Ni Muvadi	31.7	7.82	670	8.3	65.01	580	44.69	31.15	122.35	6.0	80
12.	Khadal	30.4	7.55	730	7.8	61.56	470	11.29	81.25	168.95	7.0	185
13.	Gugalia	30.8	7.3	460	7.2	126.35	643	13.56	95.29	249.69	9.5	305
14.	Badarpur	29.7	7.98	1250	6.7	52.54	590	14.60	20.47	345.35	4.0	240
15.	Ravdavat	30.3	6.8	570	7.3	119.5	338	33.4	42.3	115.6	5.5	102
16.	Mundel	31.2	7.3	360	6.2	75.6	468	23.5	34.1	320.3	6.5	135
17.	Ladvel	33.0	7.6	410	8.3	53.4	512	11.09	16.8	246.5	7.3	126
18.	Bhagat Na Muvada	31.5	8.1	390	6.9	36.9	632	15.96	27.9	168.7	10.5	85
19.	Anara	32.6	7.4	680	7.1	95.3	355	36.9	30.2	210.8	8.5	98
20.	Porada	29.8	7.1	870	8.4	85.3	256	10.56	17.3	54.5	6.5	165

Nitrate:

In the present study nitrate ranged from 60 mg/l to 450 mg/l. The tolerance range for nitrate 20mg/l to 45 mg/l. Nitrate nitrogen is one of the major constituents of organisms along with

carbon and hydrogen as amino acid, protein and organic compounds present in the bore wells water. In the present study nitrate nitrogen levels show higher values than the prescribed values. This may be due the excess use of fertilizers and pesticides in this area.

CONCLUSION

Physico-chemical analysis such as temperature, pH, dissolved oxygen, total dissolved solids, chloride, total alkalinity, calcium and magnesium hardness, sulphate, phosphate nitrate of bore wells water was carried out. TDS value should be less than 500 mg/l for drinking water. All the sample station except sample station no 14 higher ranged as prescribed by WHO and Indian standards. It can affect human being and plants. From the data of drinking water we should know the properties of bore-well drinking water which is used to prevent our plant growth.

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