



The Study of Water Quality of Pulankurichi in Sivagangai District, Tamil Nadu

G. Subramanian, P. Ramadevi, V. Pitchammal and R. Ramanathan*

Department of Chemistry, V.S.S. Govt. Arts College, Pulankurichi-630 413, Dist. Sivagangai, T.N.

*Department of Physics, V.S.S. Govt. Arts College, Pulankurichi-630 413, Dist. Sivagangai, T.N.

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ABSTRACT

Assessment of physico-chemical parameters of water in four places in Pulankurichi of Sivagangai district was carried out. Water samples from one bore-well and three open-ponds were collected and analysed. The chemical quality was compared with the drinking water quality standards. Several parameters like pH, turbidity, electrical conductivity, chloride, sulphate, total hardness, alkalinity, total dissolved solids, dissolved oxygen and BOD were analysed. The results of the study indicate that groundwater quality in the study area is suitable for drinking purpose.

INTRODUCTION

Pulankurichi is an important village in Sivagangai district of Tamil Nadu. It is six kilometres from Ponnamaravathy, a major town in Pudukkottai district of Tamil Nadu. It has historical importance; even before the British rule in India and during independence movement also, this village has participated. The village is far from industrialization. At present, there are no data available on the physico-chemical characteristics of surface water as well as groundwater of Pulankurichi. There are many man-made ponds in the village and water from these ponds is used for drinking purposes. In many houses, bore well water is used for drinking. Further, it is important to note that in the adjoining areas, the water quality is poor, but in Pulankurichi, the colour and taste of water is good. Hence, an attempt was made to analyse the physico-chemical parameters of the open pond as well as bore well waters.

MATERIALS AND METHODS

Sampling methods: Samples of bore well water and open pond water in Pulankurichi were collected in high grade plastic bottles of one-litre capacity after rinsing with distilled water and thrice with the sample water before collection. The location and source of water samples are shown in Table 1.

Analysis methods: Samples were brought to the laboratory and the parameters like pH, electrical conductivity and total dissolved solids of water samples were measured immediately after sample collection. Other physico-chemical parameters were analysed within 36 hours. Standard methods were adopted for the analysis of the water samples (APHA 1989).

Table 1: Source of water samples in Pulankurichi, Sivagangai district.

S.No	Sample Code	Location	Source
1	S ₁	College	Bore-well
2	S ₂	Pallankeni	Open pond
3	S ₃	Periya Oorani	Open pond
4	S ₄	Near college	Open pond

RESULTS AND DISCUSSION

Table 2: Physico-chemical parameters of water samples at four selected places in Pulankurichi, with the standard values for comparison.

S.No.	Parameters	BIS (1998)		S1	S2	S3	S4
		P	E				
1.	pH	6.5	9.2	8.1	7.1	7.3	8.3
2.	E.C.	-	1400	705	191	345	599
3.	Sulphate	200	400	15	8	33	9
4.	Chloride	250	1000	48	22	42	20
5.	BOD	-	5	3.2	12	13	9
6.	TDS	500	1000	480	120	235	360
7.	Total hardness	300	600	242	35	96	210
8.	Total alkalinity	200	600	251	52	66	253
9.	DO	-	-	7.2	15.5	15.3	13.1
10.	Turbidity	5	25	3.6	1.8	3.1	0.2
11.	Colour	-	-	Colourless	Colourless	Colourless	Colourless
12.	Odour	-	-	Odourless	Odourless	Odourless	Odourless
13.	Taste	-	-	Tasteless	Tasteless	Tasteless	Tasteless

P-Permissible limit, E-Excessive limit. All parameters are in mg/L except pH, colour (Hazen units) and electrical conductivity ($\mu\text{mhos/cm}$).

The water quality data of physico-chemical parameters of the study area are given in Table 2. The data have been compared with BIS drinking water standards (BIS 1998). All the four samples were clear and colourless with no odour indicating their suitability for drinking. The values of pH were above permissible limit but within the excessive limit. The sulphate and chloride levels of the samples were low, which is good for drinking. Total Dissolved Solids (TDS), turbidity, E.C. and total hardness of the water samples were within the prescribed limit. Dissolved oxygen (DO) level was good.

The maximum desirable limit of BOD for drinking water is 5 mg/L. In the present investigation, BOD value of water samples varies from 3.2 to 13 mg/L. The water samples S_2 , S_3 have BOD values higher than the maximum desirable limit of 5 mg/L. The high BOD values clearly indicate pollution, which may be attributed to the percolation of wastewater loaded with biodegradable matter.

Total alkalinity values ranged from 52 to 253 mg/L. Total alkalinity value for the sample S_1 is 251 mg/L which is higher than the BIS recommended value of 200 mg/L as the permissible limit and 600 mg/L as the excessive limit. The water sample S_4 shows alkalinity of 253 mg/L, which is higher than the permissible limit but lower than the excessive limit. Greater alkalinity shows presence of alkali salts of sodium and potassium in addition to calcium and magnesium.

CONCLUSION

The physico-chemical analysis of open pond and bore-well water samples shows that they are colourless and with normal odour. The analysis further shows that the waters have good physico-chemical characters for use as drinking water.

REFERENCES

- APHA-AWWA-WPCF, 1989. Standard Methods for the Examination of Water and Wastewater, 16th Ed. American Public Health Association, Washington DC.
 BIS 1998. Indian Standard Specification for Drinking Water IS 10500. Bureau of Indian Standards, New Delhi.