



Short Communication

Study of Some Physicochemical Parameters of Drinking Water Sources in Tembhurkheda and Jarud Region Dist. Amravati, MS, India

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Abstract

Physicochemical analysis of water samples DAP-I, DAP-II, DAP-III, DAP-IV, DAP-V have been collected from Tembhurkheda and Jarud Dist. Amravati (MS, India) region 95% people of this region are farmers, businessmen and labours. Insecticides, pesticides and various fertilizers were used for getting higher yield of crops, vegetables, fruits which is continuously create soil, air and water pollution, all these things in to consideration to carry out physicochemical analysis. Physicochemical analysis of water samples it was found that, generally all parameters studied do not show undesirable effect on the human being except in few parameters.

Keywords: Physicochemical parameter, drinking water sources.

Introduction

Good drinking water quality is essential for the well being of all people. Quality of groundwater is equally important to its quantity owing to the suitability of water for various purposes. Water quality analysis is an important issue in groundwater studies. Variation of groundwater quality in an area is a function of Physical and chemical parameter. Unfortunately in many countries around the world, some drinking water has become contaminated, which has impacted on the health and economic status of the populations. It is fact that polluted water is one of the biggest killers and is responsible for 27000deaths a day in the world's poorest countries¹. Ground water contamination include industrial spills, leaking oil and chemical storage tanks and diffuse sources of Ground water contamination include pesticides and fertilizer use². Minerals are good for human health but in appropriate quantity. If minerals are consumed in high or low intake, it may impose life threatening risk to human health³. Among all the minerals, fluoride is one of the important in ground water that prevents the tooth decay and controls the metabolic bone diseases⁴. Various types of water related activities can cause beneficial or adverse impacts on the environment, water channelization, flood, land alteration and changes in land use patterns. In recent years continuous growth in pollution, rapid industrialization and accompanying technologies involving waste disposal has endangered the very existence of human race⁵⁻⁶.

T.Bhattacharya et.al. have been carried out Physico-Chemical analysis of ground water of Anand district, Gujarat in India⁷. Koul Nishtha et. al. reported Physico-Chemical analysis of tap water in Millennium city Gurgaon, Haryana, India⁸. M.R. Mahananda et.al. have carried out⁹, Physico-chemical analysis

of surface and ground water of Bargarh district, Orissa, India. Arunabh Mishra and Vasishtha Bhatt have carried out¹⁰, Physico-Chemical and Microbiological Analysis of under Ground Water in V.V Nagar and Nearby Places of Anand District, Gujarat, India They have analyzed different parameters like pH, TDS, hardness, conductivity, dissolved oxygen and chemical oxygen Demand, MPN. It is conclude that the quality of water samples was acceptable according to physico-chemical analysis while as per Bacteriological standards, the water needs to be treated before using it in domestic purposes. Physico-chemical characterization of groundwater samples are taken from Dindigul Town Tamilnadu, India reported by Mohamed Hanipha and Zahir Hussain¹¹.

On the world map Nagpur city from Maharashtra state is popularly known as "Orange City" and famous for oranges. All the farmers, stockiest and businessman bring their oranges and distributed through out the world. The actual orange zone begins from Kalmeshwar-Katol-Warud-Shendurjana Ghat-Pusala-Jarud -Morshi-Chandur Bazar-Paratwada -Anjangao Surji. The agriculture land it is termed as "Orange Belt".

Material and Methods

The sites from two bore-wells and one well from jarud were selected because from these sites the water is daily used for drinking as well as irrigation purpose DAP-I - The sample collected from the well Tembhurkheda, DAP-II - The sample collected from the bore well of East side of Jarud, DAP-III - This sample is collected from the bore well of Middle region of Jarud. DAP-IV - This sample is collected from the well of Jarud-Warud highway which is 0.5Km from Jarud. DAP-V -

This sample is collected from the well of Jarud-Warud highway Which is 1.5 Km from Jarud.

The glass and polythene bottles were used for the collection for samples. Before sampling the bottles were treated with dilute mineral acid solutions for two days and they were washed with dilute water (no acidic to litmus) Nearly one litre water sample

was collected in between 10 am to 11.30 am. Before performing physicochemical analysis the water samples was filtered and filtrate was used for physicochemical analysis. The Physicochemical Parameters such as temperature, pH, conductance, total hardness, temporary hardness, permanent hardness, calcium, magnesium, alkalinity, B.O.D., C.O.D., chlorides was determined by using standard methods¹²⁻¹⁴.

Table-1
Physicochemical Parameters of Drinking Water Sources

Sr.No.	Sample No.	DAP-I	DAP-II	DAP-III	DAP-IV	DAP-V
1	Temperature (°c)	23.4	23.8	24.5	27.1	26.8
2	Ph	7.34	6.83	6.89	7.33	7.21
3	Conductance (Mhos/cm)	51.7	48.7	56.1	62.1	43.3
4	Total Hardness (mg/L)	153.4	198.42	128.43	134.53	102.8
5	Temporary Hardness (mg/L)	85.9	118.24	60.93	72.24	39.18
6	Permanent Hardness (mg/L)	67.5	79.18	67.5	61.29	63.62
7	Calcium Hardness (mg/L)	68.4	110.12	21.6	43.93	50.7
8	Magnesium Hardness (mg/L)	85.0	88.13	106.83	90.60	52.10
9	Total Alkalinity(ppm)	73.63	29.18	27.87	76.52	60.17
10	B.O.D. (mg/L)	1.7	3.1	3.2	2.6	1.9
11	C.O.D. (mg/L)	2.7	4.1	3.9	2.2	3.6
12	Chlorides	22.08	54.69	53.87	31.82	37.26

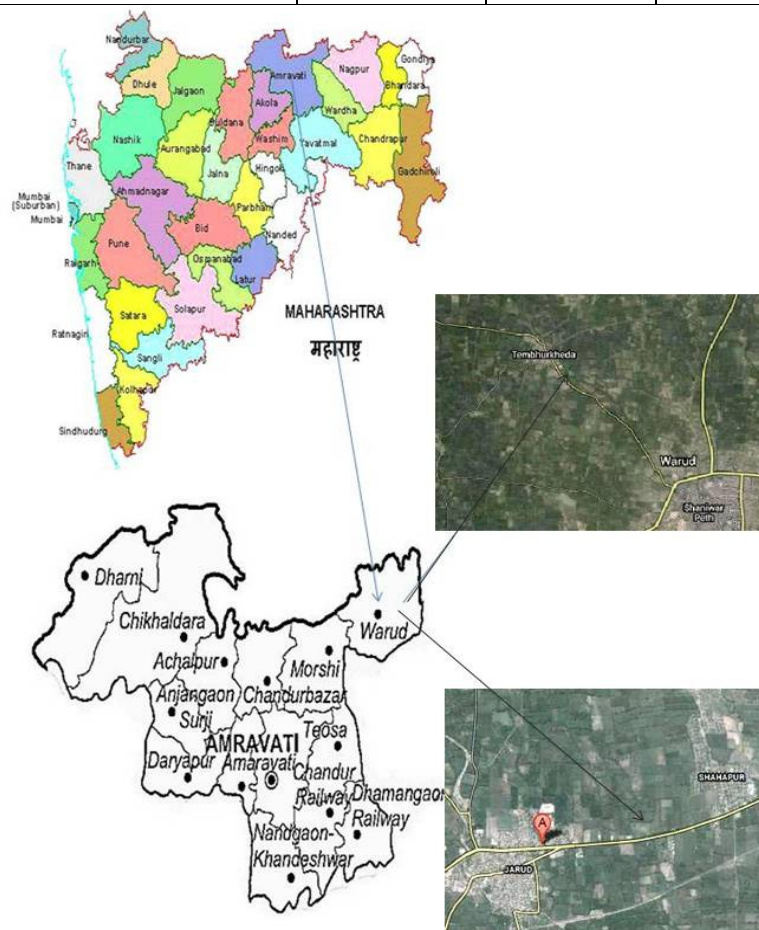


Figure-1
Study Map

Results and Discussion

The range of water temperature during the present study was in between 23.4°C to 27.1°C. The determination of pH of water is very important as it plays a role in the growth of flora and fauna of the aquatic body and also indicates whether the water is safe for drinking and irrigation purpose. The range of pH in water 6.83 – 7.34, the normal pH range for drinking water according to Indian standards is 6.5 to 8.5. Undesirable effects outside the desirable limit will affect the mucous membrane and/or water supply system.

There is decrease in values of Conductance which clearly indicates that silently water of this region is polluted. The present investigation shows that the concentration of Calcium of the water sample is 21.6-110.12 mg/L. DAP-II water sample containing high concentration of calcium than other water samples as classified as 'Calcium rich'.

The total hardness of water sample was found in between 102.8 to 194.4 mg/L. From the booklet of NEERI Nagpur ,page no.38 clearly indicates that when the range of hardness is in between 0-69 mg/L the water is soft, when it is in between 70-120 mg/L then it become medium, when it is in between 120-180 mg/L then it become hard, when it is above 181mg/L it is very hard and when it is above 300 mg/L causes adverse effect on domestic use.

The suitability of water resources for the drinking and irrigational use in agriculture is depending upon salt concentration, especially chloride content. In this region water sample chloride content was in the ranges from 22.08 to 54.59 mg/L. According to WHO maximum permissible limit for chloride is 500 mg/L.

Conclusion

From the results of physico-chemical analysis in the present investigation indicates that the quality of underground water parameters like pH, chloride, total hardness and calcium lye within the maximum permissible limit prescribed by WHO and Indian standards specification for drinking water except magnesium which just cross the desirable boundary line. It has also been concluded that the water has no hazardous effect on human health. So on the basis of these, water was potable.

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