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RESEARCH ARTICLE

WATER QUALITY ANALYSIS OF BOREWELL WATER OF SOME SELECTED AREA OF BEED CITY

***Jogdand, S.K.**

P.G. Dept., of Botany, Mrs. K.S.K. College, Beed

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ABSTRACT

Water is the main source of life without it life cannot be possible.Good quality of water is described by its physio-chemical and biological characteristics. In present study borewell water samples of six areas of Beed citywere studied for analysis of various parameters using titrimetric spectrophotometric method. The findings showed that pH, temperature, turbidity, chloride, nitrate, iron and total hardness of all the bore well water samples were below the WHO limits while phosphate and magnesium gave values above the WHO limits for all samples. Sample of Ganeshnagar gave maximum value of magnesium. Vidyanagar borewell sample showed higher conductivity value. Generally results exhibited significant variation in the parameters studied on the samples; this could be attributed to the geographical positions and depth of the bore wells.

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INTRODUCTION

Water is the most important and abundance compound of ecosystem. All living organisms on the earth need water for their survival and growth (Greenhalgh, 2007). Earth is the planet having 70% of water. About 80% of earth surface is covered by water out of which only small fraction is available for consumption. The rest is locked in ocean as salt water, polar ice caps, glaciers and underground (S.S.Dara. 1995). Ground water is defined as water that is found underground in cracks and spaces in soil, sand, and rocks. This source has two distinct functions; firstly it is a significant source of both urban and rural population's water supply and secondly it sustains many wetland ecosystems (Adeyemo *et al*., 2002). The source of ground water supply mostly depends upon the rain fall and resulting percolation of the water in the earth, another important factor is the type and quality of the soil (Adoniand Joshi, 1987). But due to human population, industrialization, use of fertilizers in the agriculture and manmade activity it is highly polluted with different harmful contaminant. There for it is necessary that quality of drinking water should be checked at regular time intervals because due to use of contaminated drinking water human populations suffers from varied borne diseases (Basavraja *et al*., 2011).

Corresponding author:** ***Jogdand, S.K.,
P.G. Dept., of Botany, Mrs. K.S.K. College, Beed.

Ground water is already used throughout wells and bore wells. Unfortunately underground reservoirs are renewed only slowly by natural seepage. Ground water is available source of water supply because it is unpolluted due to restricted movements of pollutants in soil profile (Lamb J.C. 1985). However when water travels through the ground it dissolves part of soil components so it is usually hard, it may usually contain objectionable concentration of salts such as those of iron and manganese (E.I Udoessien,1997). 2More than 3.4 million people die each year from water sanitation and hygiene related causes. Nearly all deaths occur in developing world (WHO, 2008). UNDP also reported that the water and sanitation crisis claims more lives through diseases than only war claims through guns (UNDP, 2006) Thus the quality of as well as quantity of clean water supply is of vital significant for the welfare of mankind. Beed is the city is lying to the foot hill of Balaghat Range of Beed district, in Maharashtra State, India. It is rain shadow zone therefore there is scarcity of water. Geographical location of Beed is suitable for major source as bore water. Hence bore well water are presumed to be major source of good water and have been increasingly commercialized for water starved population of Beed city. The quality of this water not guaranteed and could cause health problems as a result of consumers drinking from such sources. This research investigated some physio-chemical and biological parameters of eight bore well water constantly in uses by the water vendors.

MATERIALS AND METHODS

Beed city is an administrative district in Maharashtra in India. The district occupies an area of 10,693 kms and has populations of 17.91% were urban. Its geographical coordinates are latitude:18°.49'59.99"N and Longitude: 75°.44'59.99"E.

Sample collection: Water sample used to study were collected from six bore wells in Beed city. These samples were collected using pre cleaned polyethylene bottles of one liter capacity, for each and labeled Shivajinagar, Vidyanagar, Swarajyanagar, Shehenshahanagar, zamzam colony and Ganesh nagar. This study did not put the depth and site of the bore well into consideration.

Sample preservation and Treatment: Some physical parameters were analysed on the bore well water samples at the site of collection. The temperature of each sample was measured and recorded using a thermometer calibrated in the degree Celsius. The samples were then transferred to laboratory and in an improved ice box where they were kept in the refrigeration to preserve the quality of sample prior to analysis. All the apparatus used for analysis were properly washed and rinsed and the reagents are all of analytical grade. Standard method of analysis was employed in the various physic-chemical parameters determined Electrical conductivity meter (Perkin-Elmer model) was used. The chemical parameters: calcium, magnesium, alkalinity, chloride and total hardness were determined by titrimetric method. Nitrates and phosphates were obtained using a Jenway visible spectrophotometer (model720). For pH determination of the water samples, a digital pH meter standardized with buffer solutions of pH 4 and 9 was employed. All measurements were completed in triplicate and the mean values recorded on the Table 1.

RESULTS AND DISCUSSION

The results of the BOD, COD and physio-chemical parameters obtained in eight bore well samples are presentedon the table 1

TEMPERATURE: The water samples temperatures ranged between(31.1-32.3°C) with the bore well Zamzam colony having highest temperature and bore well Ganeshnagar have the lowest. Temperature values are known to depend on climatic conditions at a particular geographical area and period.

pH: Highest pH value of water observed in bore well water of Vidyanagar and Ganeshnagar. Various factors bring out changes in pH of water.

TURBIDITY: The turbidity is due to the presence of colloidal particles during rainfall, from industrial waste or sewage discharge. The bore well samples ranges in between 0.5 - 0.80NTU.

ALKALINITY: Swarajyanagar bore well sample shows highest value 4.10 mg/l. Sample of Shhenshhanagar showed minimum 3.40 mg/l alkalinity value.

NITRATE: The values of observed samples are ranges between 1.9 – 2.6 mg /l which are well below 50mg/l permissible limits in drinking water by WHO.

CHLORIDE: Shahenshhanagar bore well water sample showed highest value and Ganeshnagar bore water sample showed lowest value.

HARDNESS: The total hardness ranges in between 200 - 613 mg/l. Ganeshnagar showed highest hardness of water. Other samples are in the normal range.

MAGNESIUM: Shivajinagar bore well water sample showed the lowest value while other bore well samples shoeing highest values.

CALCIUM: The highest value of calcium observed in the sample of Zamzam colony bore well and lowest in Vidyanagar and Shahenshahanagarwater sample.

PHOSPHATE: The phosphate value in all six samples ranges from 0.60 mg/l -6.58 mg /l suitable for the growth of plants.

BOD: Biological Oxygen Demand is the amount of dissolve oxygen required for biochemical decomposition of organic compounds and oxidation of certain inorganic materials. All samples having BOD range within limit given by WHO.

COD: COD values of all bore well water samples ranges from 10 -93 mg/l.Swarajyanagar water sample showed highest COD value with high level of organic materials.

Table 1. Physico-chemical water analysis of bore wells in Beed city

Sr. No.	Parameters	Shivajinagar	Swarajyanagar	Vidyanagar	Shehenshahanagar	Zamzam colony	Ganesh nagar
1	Temperature (°C)	31.1	31.6	32.0	31.2	32.3	30.00
2	pH	7.9	7.8	8.0	7.80	7.8	8.0
3	Turbidity(NTU)	0.30	0.30	0.33	0.38	0.5	0.80
4	Alkalinity(mg/l)	4.10	3.90	5.80	3.40	4.30	3.60
5	Nitrate(mg/l)	2.6	1.90	0.38	0.90	0.40	0.80
6	Chlorides(mg/l)	60.30	72.00	78.00	97.00	77	58.00
7	Conductivity(us/cm)	216	215	600	414	320	260
8	Hardness	410	390	290	300	200	613
9	Magnesium(mg/l)	48	78	142	200	180	205
10	Iron(mg/l)	0.04	0.06	0.07	0.16	0.16	0.18
11	Calcium(mg/l)	78	85	75	75	80	100
12	Phosphate(mg/l)	1.38	6.58	1.20	4.50	0.60	3.55
13	BOD (ppm)	0.8	0.9	0.8	2.0	2.5	1.2
14	COD(mg/l)	16	93	18	13	26	15

CONCLUSION

Physico-chemical analysis and BOD and COD were carried out on six borewell water samples in Beed city. The results showed that all the samples of Shivajinagar to Ganeshnagargave concentration values below the WHO maximum permissible limit in water WHO for pH, temperature, turbidityalkalinity, hardness, nitrate andiron whereas COD showed values above the WHO limit while phosphate and magnesium gave values well above the WHO limits for all samples. Sample of Ganeshnagargave maximum value of magnesium. The results showed significant variations in the parameters studied on the samples;this could be attributed to the geographical position and depth of the bore wells.

REFERENCES

Adeyemo O.K. Ayodeji I.O. and Aiki- Raji C.O (2002) "The water quality and sanitary conditions in a major abattoir Bodija in Ibadan, Nigeria"*Afr. Jr. Biomed.Res.5;*pp51-55.

Adoni A.D. and Gunawat Joshi (1987) ' Physico- chemical regime of fresh water bodies in and around Sagar (M.P) Geobios 6(1): pp43-46.

Basavraja, Simpi, S.M. Hieremathk. N.S. Murthy, K.N. Chandrashekarappa, Anil N. Patel, E.T. Puttiah, (2011). Analysis of water quality using physic-chemical parameters Hosahalli Tank in shimoga District, Karnataka, India, Global journal of science frontier, research, 1(3), pp31-34.

Udoessien E.I. (1997). Pollution studies of air water and land; unpublished materials on environmental chemicals pp28-44.

Greenhalgh, Alison Healthy living water. BBC Health Retrieved 2007-02-19.

Lamb J.C. (1985). Water quality and its control. John Wiley and Sons, New York.

Dara S.S. (1995). A text book of environmental chemistry and pollution controls Chand and company limited, pp65.

United Nations Development Programme (UNDP) (2006). Human development report 2006, Beyond scarcity: Power, Poverty and the Global Water Crisis.

World Health Organisation (WHO) (2008). Safer water better health: Costs, benefits, and sustainability of interventions to protect and promote health, Updated table 1WSH death by region, 2004.

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