Journal of Medicinal Chemistry and Drug Discovery
ISSN: 2347-9027
International peer reviewed Journal
Special Issue
Analytical Chemistry Teacher and Researchers Association
National Convention/Seminar
Issue 03, Vol. 02, pp. 18-24, 8 January 2017
Available online at www.jmcdd.org

ASSESSMENT OF GROUND WATER QUALITY OF COLLEGES OF BEED CITY

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1. INTRODUCTION

Ground water is precious natural resource for several vital functions such as for public, industrial and agricultural water supply. It is the surface water that seeps into the ground. The water seep down through the fine gaps between sand particle's displacing the air until it finds its level. The ground water acts as a reservoir by virtue of large pour spaces in earth materials. It is stored in karstic, fissured and porous aquifiers. It provides drinking water to almost a third of the population and irrigates about 18% of the crop land.

Due to the increased demand the ground is being excessively exploited. The ground water is used for domestic, industrial and agricultural purposes. Now a day's ground water sources are observed to be affected of pollution and over exploitation, this presents a serious threat. Therefore it is essential to study the ground water quality. Many workers such as Dayal Gopal(1992), Mittal et al (1994), Nageswara Rao (2005), Pawar SK(2005), Meenabai(2006), Anupama Asthana(2006),Abdul Rahim and Syed Hussain (2011) [3-10]had carried out studies on various ground water sources at different locations.

The present work is undertaken to study the physicochemical characteristics of the ground water from five different college campus bore wells such as Balbhim college campus (BCC), Swa. Sawarkar college campus (SSCC), Bankatswami college campus (BSCC), KSK college campus (KSKCC) and Milliya college campus (MCC). Beed is a district with a population of approximately six lakh. Apart from corporation water supply, most of the population depends on ground water for

their daily use. Keeping in view above fact it was decided to analyze the groundwater. The physicochemical characteristics such as Color, Odor, Temperature, pH, Electrical Conductivity, Salt Concentration, Carbonates (CO_3^{2-}), Bicarbonates (HCO_3^-), Calcium (Ca^{2+}), Magnesium (Mg^{2+}) and Chlorides were studied on the water samples collected from ground water sources (bore wells).

2. MATERIALS AND METHODS

Ground water samples were collected from five different college campus of Beed city in polythene bottles in the month of March-2016.All chemicals used were of analytical grade from SD fine chemicals Ltd. The solutions were prepared in double distilled water. The Thermostat model SL-131 (Adar Dutt and Co (India) Pvt. Ltd. Mumbai) was used to maintain the temperature constant. The pH measurement were made using a digital pH meter model Elico L1- 120 in Conjunction with a glass and reference Calomel electrode (reading accuracy ±0.01 pH units) the instrument was calibrated at pH 4.00, 7.00 and 9.18 using the standard buffer solutions. The electrical conductivity measurement were made using a digital conductivity meter in conjunction with a conductivity cell having cell constant = 1(one). The instrument was calibrated using the standard KCl solution.

All the physicochemical parameters such as pH, electrical conductivity, salt concentration, carbonates (CO_3^{2-}), bicarbonates (HCO_3^-), calcium (Ca^{2+}), magnesium (Mg^{2+}) and chlorides were analyzedby referring standard procedures of***Laboratory testing procedure for soil & water sample analysis***, Govt. of Maharashtra, Water Resources Department (WRD), Directorate of Irrigation Research & Development (DIRD), Pune (2009)[1] and ***Standard method for examination of water and waste water*** APHA, 19th edition, Washington, U.S.A. (1998)[2]

Table 1: Physico-Chemical Characteristics of ground water samples of colleges of Beed city (March-2016)

Parameters ↓	**BCC**	**SSCC**	**BSCC**	**KSKCC**	**MCC**
Color	Colorless	Colorless	Colorless	Colorless	Colorless
Odor	Odorless	Odorless	Odorless	Odorless	Odorless
Temperature (^oC)	25 ^oC	25 ^oC	26 ^oC	26 ^oC	25 ^oC
pH	7.46	7.05	7.55	7.34	7.02
Electrical Conductivity (ds/m)	1.541	2.330	1.416	1.745	1.816
Salt Concentration	15.14	23.30	14.16	17.45	18.16

(me/L)					
Carbonates(CO_3^{2-}) (me/L)	1.92	3.68	4.32	2.24	4.48
Bicarbonates(HCO_3^-) (me/L)	4.28	4.72	3.88	5.16	4.72
Calcium(Ca^{2+})(me/L)	1.2	2.6	0.9	0.6	1.0
Magnesium(Mg^{2+}) (me/L)	12.4	6.4	3.9	5.0	10.2
Chlorides (meq/lit)	5.12	6.88	4.88	4.96	5.28

{BCC - Balbhim college campus, SSCC - Swa. Sawarkar college campus, BSCC - Bankatswami college campus, KSKCC - KSK college campus and MCC - Milliya college campus}

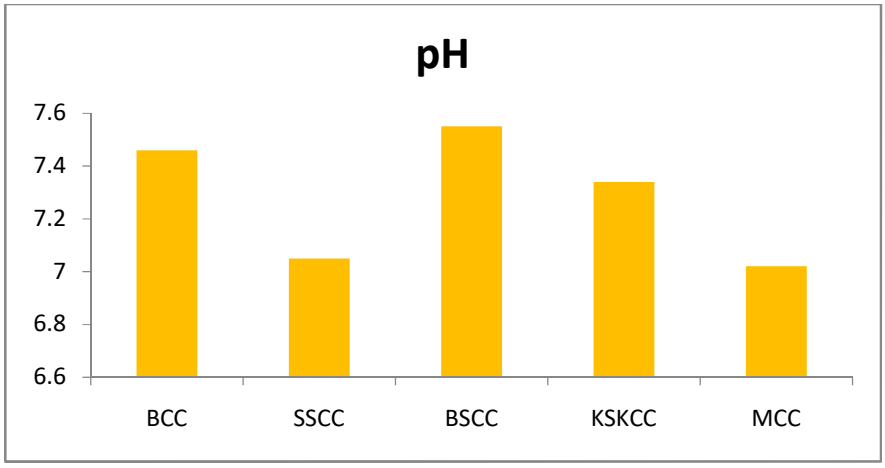
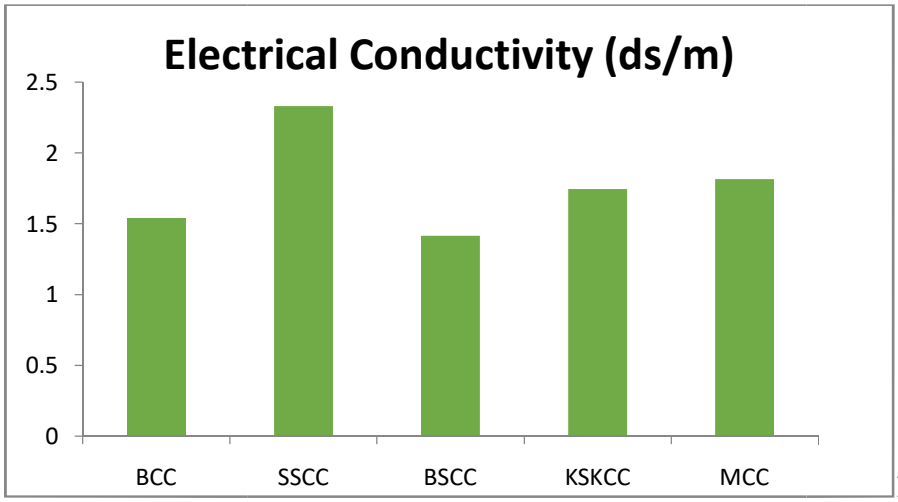


Figure 1.



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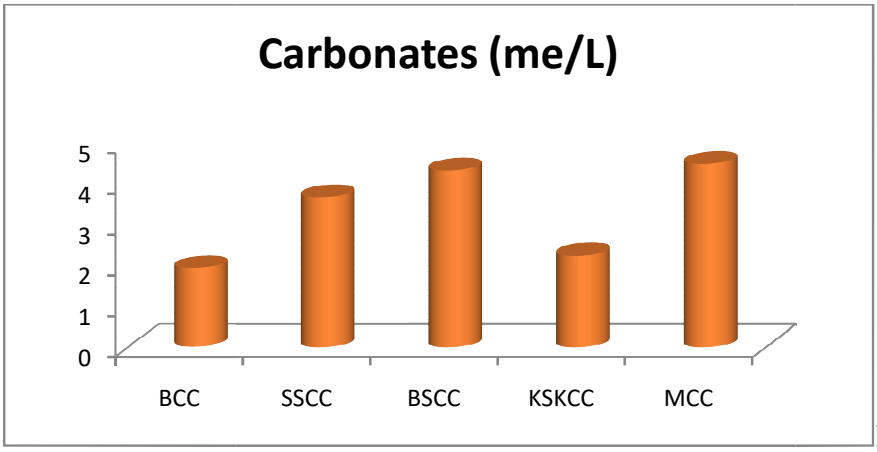

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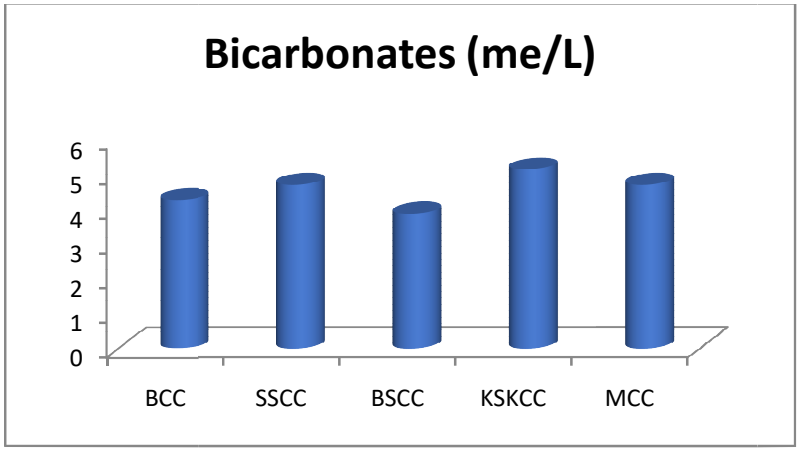

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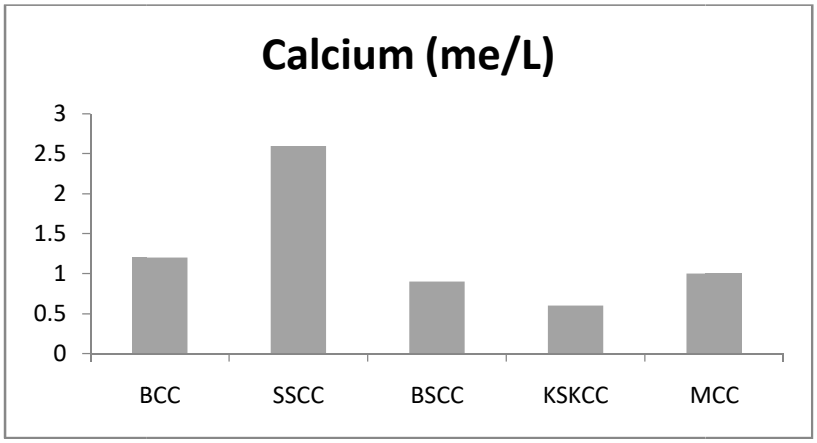

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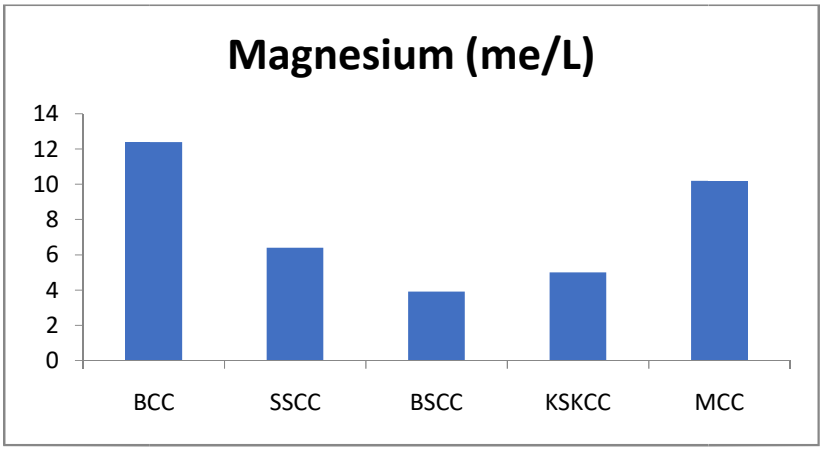

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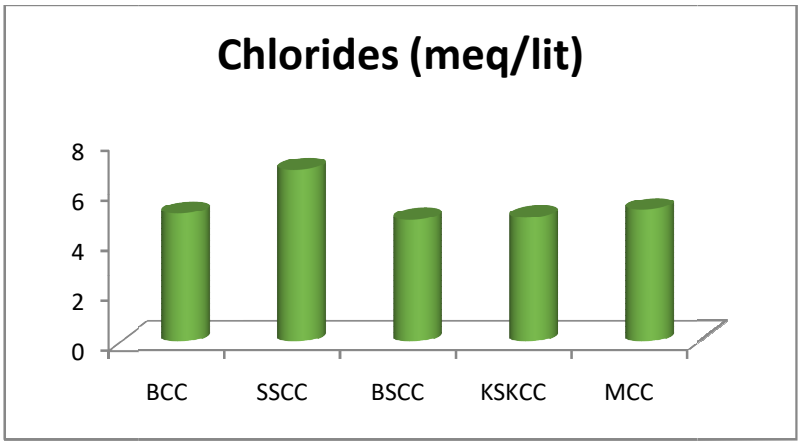

Figure 7.

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6. RESULTS AND DISCUSSION

The physicochemical parameters are recorded in the month of *March-2016*are given in the Table 1. The color and odor of all the samples were colorless and odorless. The pH values of all the samples were found in the range (7.02 to 7.55) of suitable drinking water standards. pH indicated nearly neutral range, it was slightly alkaline.ElectricalConductivity ranged between 1.416 to 2.330 ds/m with maximum being at SSCC bore well (2.330 ds/m) and minimum being at BSCC bore well (1.416 ds/m). Salt Concentration ranged between 14.16 to 23.30 me/L with maximum being at SSCC bore well (23.30 me/L) and minimum being at BSCC bore well (14.16 me/L).Carbonates (CO_3^{2-}) were found to be maximum at MCC bore well (4.48me/L) and minimum at BCC bore well (1.92 me/L).Bicarbonates (HCO_3^-) were found to be maximum at KSKCC bore well (5.16me/L) and minimum at BSCC bore well (3.88 me/L).Calcium (Ca^{2+}) were found to be maximum at SSCC bore well (2.6me/L) and minimum at KSKCC bore well (0.6 me/L).Magnesium (Mg^{2+}) were found to be maximum at BCC bore well (12.4me/L) and minimum at BSCC bore well (3.9 me/L). High chloride level indicates pollution from domestic sewage. Chloride were found to be maximum at SSCC bore well (6.88meq/lit) and minimum at BSCC bore well (4.88 meq/lit).

The physic-chemical analysis of ground water samples in colleges reveals that most of the parameters were found within permissible limit except magnesium &chloride concentration. The water level of underground is decreases in summer and hence it affects the water quality parameters. It is not possible to compare the water quality of underground water for different places, since there are various factors such as geochemical structure, depth of bore well, leaching of salt, soil texture etc. Water samples may be potable after proper treatment. However monitoring is important to detect drinking water contamination. Ground water / bore well water should not be used for drinking purpose.

4. ACKNOWLEDGEMENT

The authors are grateful to the Principal, Balbhim College Beed and Head, Department of Chemistry, BalbhimCollege Beed for providing the laboratory facilities.

5. REFERENCES

[1] Laboratory testing procedure for soil & water sample analysis, Govt. of Maharashtra, WRD, DIRD, Pune (2009).

[2] Standard method for examination of water and waste water APHA, 19th edition, Washington, U.S.A. (1998)

[3] Dayal Gopal; Ground water qualities of rural and urban settlements at Agra, *J. Nature Conserve*, 4(1), (1992) 89-93

[4] Mittal SK, J. Rao; Ground water quality of some area in Patiala city, *Indian J. Env. Hlth*, 36(1),(1994) 51-53

[5] Nageswara Rao; Statistical analysis of ground water parameters in an industrial of Hyderabad, *J. Aqua.Bio*.; 21(2), (2005)93-96

[6] Pawar SK; Studies on physicochemical parameters in Pethwadaj dam Nanded, *J. Aqua. Bio*.; 20(2), (2005)123-128

[7] Meenabai T; Assessment of ground water quality in Pollachi Taluka of Coimtore, *Nat. Env. Pol. Tech.;*5(2), (2006)295-298

[8] Anupama Asthana; Seasonal variation in ground water quality in upper part of Patna, Dist. Chhattisgarh, *Nat. Env. Pol. Tech.;* 5(1), (2006)111-117

[9] Abdul Rahim, Syed Hussain; Assessment of ground water quality of Beed city, Maharashtra, India.*Oriental J. Chem.;*27(3), (2011)1273-1275

[10] Shaikh Abdul Rahim, Sayyed Husain, MazaharFarooqui; Nitrate in ground water of Beed city of Maharashtra (India), *J.Env. Science &Engg.;* 55(4), (2013) 537-539