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ANALYSIS OF TOTAL ALKALINITY IN DRINKING WATER IN TOWN KOTPUTLI IN RAJASTHAN

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ABSTRACT

Groundwater is an important and cheaper source of drinking water. Generally, it is clean & safe and its contamination by pathogens is uncommon. However, water might possess high level of minerals like calcium, magnesium and carbonates owing to its contact with bedrocks. It affects the physical and chemical properties of drinking water. A study was designed to explore alkaline level of groundwater in town Kotputli, Rajasthan. Study revealed that total alkalinity, mean (294.3±86.21mg/L), significantly ($p<0.0001$) higher than reference value, recommended by bureau of Indian standard (BIS).

KEYWORDS:
Total alkalinity of water, Alkalinity level of drinking water.

INTRODUCTION:

Potable water is a gift of nature to mankind. It is necessary for living organisms as well as in industries, agriculture and laboratory. Quality of drinking water is of prime importance as far as health of body is concerned. Alkalinity of water is its ability to neutralize acids which enter water from sources like rain water and/ or domestic waste (USEPA, 2016). Alkalinity is a measure of amount of all bases, which can be titrated, present in water. Calcium carbonate is main source of alkalinity of natural water. It is determined by the geology of the location as well as amount of dissolution of CO2 in rain water and its percolation in soil (Wilson, 2016). Lime stone rocks liberates high amount of calcium carbonate. When water flows through lime stone rocks, it gets dissolved in natural water (WRC, 2014). But compounds like phosphates and borates can also contribute to alkalinity of water.

Water alkalinity is helps to maintain pH of drinking water. Otherwise, frequent change in pH of water might be detrimental to life of aquatic organisms.

MATERIALS AND METHODS

Sample collection

In the town, Kotputli, Rajasthan, sites (n=30) were selected randomly for collection of water samples. Polythene bottles of one liter were employed for collection of drinking water samples from different sites. Bottles were cleaned

with hydrochloric acid and rinsed with tap and distilled water. Bottles were filled with groundwater and capped each bottle. Site of name was marked on every bottle.

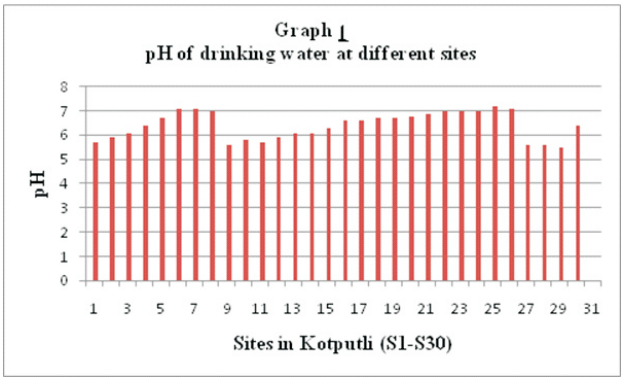
Experimentation

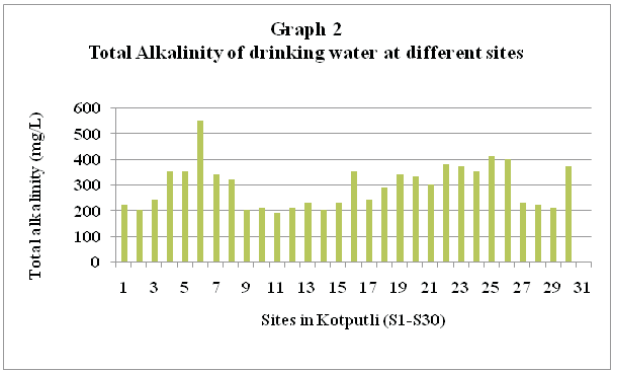
1. Color of water samples was determined by ophthalmoception (sense of sight).
2. Odor of water samples was determined by olfacoception (sense of smell).
3. Taste of water samples was determined by gustatory perception.
4. Digital pH meter was used for determination of pH of water.
5. Alkalinity testing kits were used for determining total alkalinity of water.

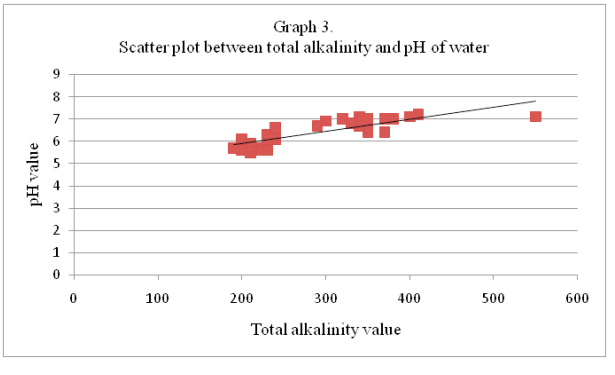
RESULTS & DISCUSSSION

Table 1. Drinking water samples analysis from Kotputli, Rajasthan

Characteristics	Reference value(BIS)	Mean	S.D.	't' test Significance level
pH	6.5 – 8.5	6.41	0.56	Not computed
Total alkalinity (mg/L)	200	294.3	86.21	<0.0001







Color of water was observed by sense of sight. It was found that all samples of water were without color deposits. Odor of water was observed by sense of smell. It was found that all samples were odorless.

Taste of water was observed by gustatory perception. It was observed that all samples had salty taste. According to (USEPA 2016), high level of sulfate, magnesium and/or sodium are responsible for unacceptable salty taste of drinking water.

pH of water

pH of water is an indicator of hydrogen ion concentration. The mean (6.41) with S.D. (±0.56) of pH of (n=30) samples of drinking water was calculated, as shown in table 1. Further, pH value exhibited variation across different sites, as shown in graph 1. Highest value of pH was found at sites 25 and 6 in the range (7.1-7.2), contrarily, the lowest value of pH of water was found at sites 1, 9, 10, 27, 28, 29 in the range (5.5-5.8), as depicted in graph 1. Moreover, mean pH (6.41) was within recommended range (6.5-8.5), according to Bureau of Indian Standards (BIS, 2012).

Total alkalinity of water

Descriptive analysis showed mean (294.3 ± 86.21mg/L) value of total alkalinity of (n=30) water samples, as in table 1. In a scatter plot between alkalinity and pH of water samples, a positive and direct correlation was observed, as depicted in graph 3.

The Highest alkalinity of water samples was observed at site 6 in range (550 mg/L) and the lowest value was seen at sites 1, 2, 9, 10, 11, 14, 28, 29 in the range (190 – 220 mg/L). Almost similar results, where alkalinity ranged between 60 mg/L to 600mg/L, were shown by a research by (Soni & Bhatia, 2015).

Further, inferential analysis described that calculated 't' value (5.9) was significantly ($p<0.0001$) higher than table 't' value (2.045) at (df=29, p=0.05), as in table 1. Hence, alternate hypothesis was accepted. High alkalinity of drinking water is injurious for health of body. It disturbs normal pH value of body fluids and impairs the enzyme function in body (NMH, 2012).

CONCLUSION

Alkalinity and pH values determine water quality. Alkalinity can be easily corrected by use of reverse osmosis technique of water purification. Water becomes safe, clean and potable.

REFERENCES

1.BIS (2012). Bureau of Indian Standard- Drinking water specification. Available at: http://www.cgwb.gov.in/Documents/WQ-standards.pdf

2.Wilson, P.C. (retrieved 2014). Water quality notes: Alkalinity and hardness. University of Florida. Available at: http://edis.ifas.ufl.edu/pdffiles/ss/ss54000.pdf

3.Narayana Multispeciality Hospital (2012). Importance of drinking water. Available at: http://waterimportance.com/alkaline-water-health-benefits/.

4.Soni, N., Bhatia, A. (2015). Analysis of Quality of Drinking Water of Private Bore-well and Piped water Supply in Jaipur city, Rajasthan, India. Res. J. Recent. Sci., 4(ISC-2014), 313-316.

5.USEPA (2016). What causes drinking water to taste salty?. 2016. Available at: https://safewater.zendesk.com/hc/en-us/articles/212079797-What-can-cause-tap-water-to-taste-like-salt-.

6.Water Research Center (2014). What is alkalinity?. Available at: http://www.water-research.net/index.php/the-role-of-alkalinity-citizen-monitoring.

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