

ANALYSIS OF MINERAL CONTENT AMONG DIFFERENT BRANDS OF WATER

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Abstract

Background: Water is essential for sustaining the health and well-being of individuals. Access to safe drinking water is now regarded as an essential human right. About 780 million individuals lack access to safe drinking water, and almost 2.5 billion people do not have sufficient sanitation.

Objective: The present study was conducted to analysis the mineral content of different brands of water.

Methodology: The study was conducted to assess the comparison of selected mineral contents among 5 different water brands. Quantitative Analysis of water using TDS and PH level was conducted and Experiment was performed for estimation of calcium, magnesium, chloride and copper in mineral water.

Results: Different brand of water samples was taken to estimate total dissolved solids and compare with WHO Standards. Among the sample-E and sample-D have shown more TDS value. (98mg/l).and sample-C(60mg/l) has shown the TDS value. Whereas all the 5 sample had shown normal ranges with WHO standard. (50-150mg/l). 5 Different brands of water were taken to estimate it PH and compare with WHO standards among the D sample and sample A has shown more PH values [7 and 8] and sample B, C, E have same value (6), where all the 5 sample had shown normal ranges with WHO standards.

Keywords: Magnesium, copper, chloride, calcium.

I.INTRODUCTION

Water is essential for sustaining the health and well-being of individuals. Access to safe drinking water is now regarded as an essential human right. About 780 million individuals lack access to safe drinking water, and almost 2.5 billion people do not have sufficient sanitation. In 2017, it is estimated that people worldwide will consume approximately 391 billion Liters of bottled mineral water (1).

Well Water: well water is the main source for drinking and household needs This is frequent in countryside regions where extensive water networks are unavailable. Well water is drawn directly from its source and flows straight to your residence. Well water may contain minerals and nutrients, and it originates directly from an underground source.

Distilled Water: Similar to mineral and spring water, distilled water can be bought as it is packaged and sold rather than being provided by community water supplies Distilled water goes through a rigorous purification procedure to remove dissolved minerals and salts [2].

Alkaline Water: Alkaline water features a higher pH level compared to tap water and is regarded as safe because it includes natural beneficial minerals vital for your body

Hard Water: Hard water has a higher concentration of calcium, iron, and magnesium compared to regular water, and this occurs because the water flows through limestone pipes in the water supply system. As it moves, it collects minerals and increases the water's hardness. Although hard water is generally safe for consumption, it can lead to dry skin, lack lustre hair, and damage your plumbing pipes

Sparkling Water: Sparkling water, also known as soda water, is carbonated water combined with carbon dioxide gas to produce that bubbly flavour. It usually has a similar composition to distilled or spring water, varying by the type of sparkling water you purchase

Mineral water: Mineral water is bottled drinking water that has minerals in specific quantities without the inclusion of minerals or the addition of oxygen (O₂) or carbon dioxide (CO₂). The technical health rationale for establishing drinking water quality standards is based on the impacts of each parameter when it surpasses the set limits [2]

II.METHODOLOGY

The study was conducted to assess the comparison of selected mineral contents among 5 different water brands, the sample was taken from 1 litre water bottle of mineral selected brands and Quantitative Analysis of water was done by calculating TDS and PH level. This experiment was done for estimation of calcium, magnesium, chloride and copper in mineral water.

III. STATISTICAL ANALYSIS

Mean, Standard Deviation and T-Test Was Performed. The t-test is a statistical technique employed to assess if there is a significant difference between the averages of two groups. It assists in testing hypotheses and is frequently utilized in comparing experimental groups with control groups in studies.

IV. RESULTS AND DISCUSSION

Different brand of water samples was taken to estimate total dissolved solids and compare with WHO Standards. Among the sample-E and sample-D have shown more TDS value. (98mg/l).and sample-C(60mg/l) has shown the TDS value. Whereas all the 5 sample had shown normal ranges with WHO standard. (50-150mg/l).

TABLE1. Estimation of TDS in different water sample.

Brand	TDS	WHO RANGES [mg/L]
Sample A	89	50-150mg/l
Sample B	84	
Sample C	60	
Sample D	98	
Sample E	96	

TABLE 2. Estimation of PH in different water sample.

BRAND	PH VALUES	WHO RANGES
Sample A	7	6.8-8.8
Sample B	6	
Sample C	6	
Sample D	8	
Sample E	6	

Table3. Association of mineral content of different brand with WHO standards.

MINERALS	A	B	C	D	E	WHO [mg/l]	t-value	P-value
CALCIUM	12.02	7.3	9.02	8.2	8.6	75	3.68	0.006
MAGNESIUM	1.2	3.8	1.7	0.2	2.6	30		

Table 4. comparison of Brand label

Minerals	A	B	C	D	E
Calcium	12.02	7.3	9.02	8.2	8.6
Magnesium	1.2	3.8	1.7	0.2	2.6
Chloride	-	0.14	0.14	0.14	0.14
copper	0.3	2.1	1.9	5.2	6.1

By comparing the brand labels sample b shown more calcium [2.8mg/100ml], magnesium [mg1.4mg/100ml], whereas sample Cand D has shown same level of calcium [1.2 mg/100ml] Magnesium [0.2 mg/100ml] followed by sample A with calcium [12.0 mg/100ml] magnesium [1.2 mg/100ml]. none of the brand have mention about chlorine and copper Sample E has mentioned about copper value [0.05] as the brand is claiming it enrich with copper.

This study findings where similar to a study which says that there is statistical significance with WHO standard and mineral content in brand. [3]

CONCLUSION:

The study concluded that all five bottled water brands tested were within the permissible limits set by the World Health Organization (WHO) for Total Dissolved Solids (TDS), pH, calcium, magnesium, and chloride levels. Sample D and E showed higher TDS values, while pH levels were slightly higher in Samples A and D. Mineral analysis revealed variations among the samples, with Sample B having the highest levels of calcium and magnesium. Despite these differences, all samples were safe for consumption

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