



Study on Assessment of Water Quality in Different Bottled Mineral Water

Ms. Vijay Laxmi*

Central Pollution Control Board (CPCB), Delhi

&

Ms. Neetu Nimesh**

Department of Zoology

R.G. (P.G.) College, CCS University, Meerut

Abstract

Bottled mineral water has become essential requirement now a days in India, as the various research have proved the day by day deteriorating condition of ground water due to the increased levels of, soil water and land pollution. Mineral water is that water which contains unusually high quantities of minerals essential for our body and it is also believed that it cures many diseases like Arthritis , Ulcers and respiratory infections ,dental problems ,liver, kidney and gallbladder disorders. The study presented here was carried out on different bottled mineral water which were analysed for relevant drinking water parameters .The study shows that very less concentration of mineral nutrients were found in the bottled mineral water. Consumption of this mineral water in the long run may lead to several disorders and deficiency diseases.

Key Words: *Bottled mineral water, Bureau of Indian Standards (BIS)*

Introduction

Water is one of the essential entity of life. About 60% of human body weight is made up of water. The natural drinking water contain different minerals which are utilized by our body to support life and better functioning of human body system.

Essential micro and macro nutrients are present in natural drinking in the form of minerals, due to increased water, land and soil pollution the ground water got contaminated and polluted.

In the past course of time mineral water were traditionally known as the water from a mineral spring that contains various minerals and dissolved salts, Calcium, Magnesium and Sulphur compounds.

According to Today's scenario such mineral water is commonly known in the form of bottled water. There are around 3,000 brands of mineral waters commercially available internationally.

The water which contains more Calcium and Magnesium ions dissolved in water is known to be hard water although both Calcium and Magnesium are essentially required by the body. The decreased levels of Ca and Mg in human body may lead to several disorders.

However many of the food material also contain minerals but intake of specified food for required minerals is not possible in day to day life so the main source of minerals is water which is being consumed by every individual. About 4 - 5 times water is consumed by humans in daily basis. Which is sufficient to fulfill our requirement of Calcium and Magnesium.

The conservation and healing properties of mineral water are recognized by the Ministry of Health after clinical and pharmacological trials, and certain mineral water may be useful for providing essential micronutrients such as Calcium. World Health Organization (WHO) retains the evidence to support the beneficial effect of consuming mineral water.

Bottled mineral water for human consumption can be classified into two main categories:

1. Natural mineral water
2. Fortified mineral water

Natural Mineral Water

- a) Natural mineral water shall be obtained directly from natural or drilled source like spring, artesian well drilled well or from an underground formation and not derived from a municipal station or public water supply.
- b) Characteristics by its content of non-adverse health related mineral salts and their relative proportions and the presence of non-toxic trace elements or of other constituents.

Fortified Mineral Water

- a) Fortified mineral water shall be derived from any source of potable water, which may be blended/ treated and fortified with required mineral salts.

The treatment of mineral water after obtaining from the desired source includes de-ionization, filtration and disinfecting of water by ultra violet irradiation, ozonation, silver iodide etc. (Dee,2011).

BUREAU OF INDIAN STANDARDS**DRINKING WATER SPECIFICATIONS (Second Revision of IS: 10500)**

SL No.	Substance Characteristic	Requirement (Acceptable limit)	Undesirable effect outside the acceptable limit	Permissible limit in absence of alternative source
1.	ODOUR	Agreeable	-	Agreeable
2.	Taste	Agreeable	-	Agreeable
3.	Calcium	75 mg/l	200 mg/l	-
4.	Magnesium	30 mg/l	No relaxation	-

Materials and Methods

The bottled mineral water samples of 10 different brands were collected randomly from various market places in Delhi. Each brand was analysed for required parameters. The analysis of bottled mineral water samples for various parameters, were followed as per APHA 23rd edition.

The physical test like, odour and taste were done by physical observation. Calcium and Magnesium were analysed by titrimetric method.

The selected 10 numbers of bottled mineral water were coded as –

MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10

Results:

Table : Parameters selected for study in samples are Odour, Taste, Calcium & Magnesium

Sample Code	ODOUR	TASTE	Calcium (mg/l)	Magnesium (mg/l)
MW - 1	Odorless	Tasteless	3	10
MW - 2	Odourless	Tasteless	5	8
MW - 3	Odourless	Tasteless	7	12
MW - 4	Odourless	Tasteless	12	9
MW - 5	Odourless	Tasteless	9	7
MW - 6	Odourless	Tasteless	17	6
MW - 7	Odourless	Tasteless	8	7
MW - 8	Odourless	Tasteless	6	6
MW - 9	Odourless	Tasteless	7.5	5
MW - 10	Odourless	Tasteless	11	8

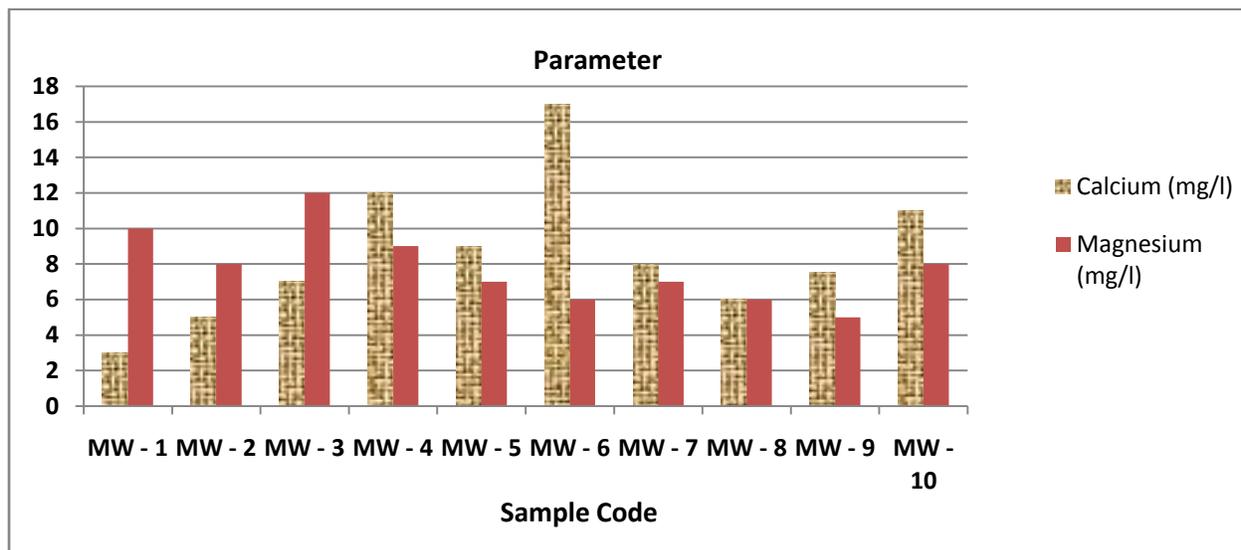


Fig.1 The above graph showing the different concentration of Calcium and Magnesium in different Mineral water samples.

Discussion:

The water which contains more Calcium and Magnesium ions dissolved in water is known to be hard water although both Calcium and Magnesium are essential requirement of the body. The decreased level of Calcium & Magnesium in water body may lead to several disorders in.

Drinking water is an important source of minerals required by our body. Human body, However, they are required in trace quantities. Calcium and Magnesium are also the important constituents of mineral water. Magnesium works with Calcium to provide energy producing enzymes that stimulates and coordinate muscles and nerves interaction.

The excess of certain elements causes various kinds of hazards to human’s health on the other hand their deficiency may lead to several disorders in humans. The bottled mineral water analysed for required parameter i. e. calcium and Magnesium are found to be really low in concentration as compared to the Bureau of Indian standards of drinking water.

Hence, the study suggested that the bottled mineral water is safe for drinking, but the regular drinking of such water may lead to deficiency of essential minerals which may finally lead to several disorders and affect the human body in long term.

References:

American Public Health Association (APHA)-23rd Edition

Bureau of Indian standard (BIS): Drinking water Specifications (Second Revision of IS: 10500)

Kablian K, Mughliaan K, Sivaneswar R,(2012)-Study on the contents of bottled mineral water of various brands in Malaysia. Journal of National Science Research

M.C.Albertini et al(2000)- Natural Mineral Water: The European Community Directives

Nicholas Dee(2011)- Blackwell Publishing limited Technology of Bottled Water- 3rd edition