



Research Paper

Physico - Chemical and Bacterial Quality of Mineral Waters and Cool Drinks

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ABSTRACT: Use of mineral water and cool drinks has become very in the daily lives of the people. The present study deals with the quality of locally marketed mineral water packed in bottle and pouches. For various sample the parameters, like pH, TDS, ALK, TH, Cl⁻, F⁻, NO₂⁻, NO₃⁻, SO₄⁻, NA⁺, Na⁺, CA⁺⁺, Mg⁺⁺, DO, COD, and MPN count Were selected and determined. The soft drinks available in the local market were also selected and analysed Ph, ec, tds, f-, so4-, na⁺, k⁺, ca⁺⁺, DO to assess their quality.

KEY WORDS: Mineral Water, cool drinks, parameters, Quality

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I. INTRODUCTION

The modern man is health conscious hence Trying to develop various materials that keep him hale and healthy and one such material in mineral water which is supposed to be quite potable with respect to various factors, like physical and chemical impurities. It isa well known fact that most of the diseases are water – borne. Hence mineral water is preferred to ordinary water especially during juring time, in hospitals, function places, residential houses, etc. A large variety of brands of mineral water heve come up in the market and unaware of the quality of these brands, we are made to consume them. Quite a good number of brands of cool drinks also have come up in the market which are consumed by the people. Even though they are bot substitutes for water they are consumed by the people who are unaware of the quality as well as after effects, if any In view of the lack of awareness of the puplic an attempt has been made by the authors to analyse some of the mineral water and cool drink samples available for various physic - chemical parameters in order to assess their quality.

II. MATERIAL AND METHOD

The mineral Water Samples and cool drink samples were analysed for PH, EC, the concentration of sodium, potassium, calcium, magnesium, cholride, fluoride, nitrate, nitrate, sulphate, dissolved . oxygen, biological oxygen demand, total hardness and total alkalinity. The Concentration of Na⁺, K⁺ and Ca⁺ were estimated by Flame Photometer (Elico CL 220). Spectrophotometric methods were used to determine the concentrations of SO₄⁻, NO₃⁻, Elico Fluoride meter was used to determine by using the determine the fluoride ion concentration. All other parameters were standard methods (APHA,1986), Trivedi and Goyal,1936, suess1982, Cruickshak(1975)

Table.1 Names and numbers of samples

Name of the sample	Sample no.
Mineral Water bottles	
King – fisher mineral water	1
Hi – tech	2
Fenvy	3
Parle beille	4
Mineral water pouches	
Crystal	6
Spring	7
Spaa aqua	8
Surya	10
Cool drinks	
Fanta	11
Limca	12
Thumsup	13
Frooti	14
Cocacola	15

Table. 2. Physico –chemical parameters of mineral water bottles, in mg/L

Characteristics	Sample number				
	1	2	3	4	5
pH	7.6	7.43	6.93	7.05	7.0
Electrical conductance, mhos/cm	354	378	1122	408	200
Total dissolved solids	60	160	360	160	4
Alkalinity	110	20	180	60	30
Hardness	74	70	204	66	13
Chleride	18.5	26.6	31.2	18.5	2.3
Fluoride	0.47	0.55	0.38	0.52	0.54
Nitrite	0.1	0.1	0.08	0.12	0.00
Nitrate	1.6	0.54	2.56	0.44	1.2
Sulphate	0.98	1.48	4.6	4.7	0.58
Sodium	7	15	27	11	20
Potassium	0	0	0	1	
Calcium	0	0	6.5	0	0
Magnesium	21.3	20.17	54.25	19.02	4.6
DO	11.4	10.0	9.6	10.2	1.
BOD	7.4	9.2	8.8	8.0	9.8

Table. 3 . Physico –chemical parameters of mineral water bottles, in mg/L

Characteristics	Sample number				
	6	7	8	9	10
pH	7.23	7.16	7.36	7.05	6.15
Electrical conductance, mhos/cm	836	1086	2128	472	704
Total dissolved solids	100	240	360	100	60
Alkalinity	120	150	240	60	140
Hardness	116	164	198	66	102
Chleride	48.3	58.2	113.6	21.3	27.0
Fluoride	0.55	0.55	0.82	0.55	0.53
Nitrite	0.11	0.12	0.16	0.18	0.12
Nitrate	2.3	0.58	2.18	0.42	0.4
Sulphate	2.88	3.88	17.2	0.88	0.38
Sodium	31	27	120	14	24
Potassium	1	1	1	2	2
Calcium	0	25	18.75	0	6
Magnesium	33.4	29.2	43.56	19.2	24.9
Dissolved oxygen	9.0	9.8	13.2	15.6	13.7
Biological oxygen demand	8.2	8.8	11.2	14.2	12.3

III. RESULT AND DISCUSSION

The locally marketed samples were selected for analysis. 5 samples of mineral water packed in to bottles and about 5 samples of mineral water in pouches were selected for analysis of physico chemical parameters. Also, 5 samples of cool drinks were selected for analysis. The name of the samples and sample numbers were listed in table 1. The results of analysis of mineral water packed bottles were presented in table 2. All the parameters determined are within permissible limits of drinking water. The Fenvy (sample 3) has high values of all parameters when compared packed other 4 samples. In all the samples as the MPN results of analysis of mineral water packed good in terms of bacteriological standards. The count is nil, it follows that all the samples are in pouches were listed in table 3. In these samples also, all the parameters determined are almost within the permissible limits. The sample spa Aqua, sample no. 8 has very high electrical conductivity, high sodium and chloride content than other samples. The MPN count all the samples from 6 to 10 is nil. The results of analysis of selected cool drink samples were presented in table 4. The pH values of samples range from 2.68 to 3.38, which are very low. These samples have very high electrical conductivity which ranges from 1348 to 2818 mhos/cm. The total dissolved solids are very high and the range is from 35,500 to 70,000 ppm. This may be due to inorganic and organic substances dissolved which impart taste, colour, etc., during preparation of the cool drink. It is observed that Frooti (sample 14) has highest content for TDS. The DO content in all the samples was nil. Sulphate content in almost all samples (Limca and Coca – Cola) the DO content is almost nil. Sulphate

content in almost all samples is high, from comparison point of view the sample no. 12. (Limca) is better in term of its quality than others with respect to various parameters.

Table. 4. Physico –chemical parameters of mineral water bottles, in mg/L

Characteristics	Sample number				
	11	12	13	14	15
pH	3.14	3.03	2.68	3.38	2.74
Electrical conductance, mhos/cm	1318	1308	2818	2298	2788
Total dissolved solids	45700	35500	39300	70600	41000
Fluoride	0.63	0.7	0.9	1.53	0.96
Sulphate	30.2	17.7	38.34	43.18	40
Sodium	27	35	14	-	13
Potassium	5	3	3	-	-
Calcium	6.5	6.5	6.5	-	6.5
Do	1.2	0	2.0	3.0	0.2

IV. CONCLUSION

The mineral water samples packed in bottles were Found to be better with respect to quality than the Samples packed in pouches. All these samples are Free from bacteria and the quality is not the same In all the sample. The variations probably are Due to different sources. It is learnt that in most of the manufacturing units available or mineral-water, they simply pass water through ion exchanger and pack the sample in sterilized bottles. the quality, purchase and consume samples are not bothering for quality. The public unaware of so called mineral water and hence they are it is also learnt that some manufacturers simply sterilized water sample. quality parameters and values are labeled on the bottle so that public will know whether the samples are good or not. The cool drink which boils the water and sends it for bottling. There is a lot of competition for the production and market- where analyses are highly acidic, full of dissolved solids and electrical conductivity. The people are oxygenated these cool drinks without knowing consuming these cool drinks without knowing their composition. This may lead to health problems, like acidity, lowering of oxygen levels in the human body, etc. if specifications and composition are labeled on the bottles. It would be good for public. The study of analysis of such materials, like mineral water and cool drink will make people certainly aware of the materials they consume. For instance, after having analysed mineral water samples, it now appears that they are like table in the market. It is good if mineral water

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