

STUDY OF BACTERIAL AND PHYTOCHEMICAL CONTAMINATION IN SOME SAMPLES OF BOTTLED AND LOCALLY PRODUCED WATER

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ABSTRACT : This study was conducted on a number of samples of the most used bottled water found in the governorate markets (Lojin, Thaghir, Sawa, Al Waha, Manar, Rawdatain, Nawar, Al Khaleej and Albakhera). The samples were between 200 500 and 1500 m. The study included detection of total colon bacteria and some physical and chemical properties, namely pH, total dissolved solids, calcium, magnesium, chlorides and sulphates in mg/l unit. The results showed that all samples were acceptable and suitable for using the pylogia, which were within the Iraqi standard of drinking except for the water of the hole where it was polluted (15) colon colony of colon, but globally samples were water oasis and Roumtin and Manar are samples only drinkable, as for the physical and chemical tests were all the characteristics And all samples are acceptable within the Iraqi and international standards for drinking water, but most of the values were greater than mentioned on cans mentioned by the manufacturers.

Key word : Bottled water, bacteria, hardness, sulphate, chloride.

INTRODUCTION

Drinking water is one of the most necessary human needs and cannot be dispensed with in the recent herbal industry. The bottled water industry has become more popular all over the world. One of the reasons for this proliferation is the quality of bottled water and the regularity of that quality in terms of taste and other qualities while the water of the liquefaction network is variable quality depending on the changes in the source as well as the possibility of being contaminated by the biological or physiochemical from the surrounding environment during transport in pipelines and reservoirs For long distances to reach the consumer while the bottled water is a little pollution because they are placed in sealed containers and the closure of drinking water .Consumer confidence is required in the validity of liquidation stations, especially in summer (Arnold, 2006). Drinking water must be pure and free from all types of chemical, physiological and microbial contaminants, which are very dangerous to human life (OECD, 2003).

In Iraq, the bottled water industry has expanded in recent years, and the consumer is dependent on bottled water in various sizes of plastic mainly in drinking. The importance of the subject has been conducted many studies to evaluate the characteristics of this type of water, including Alabdula'aly *et al* (1999), who studied

the physical and chemical properties of many local and imported samples in Saudi Arabia. Al-Musawi's and Al-Zubaidi (2010) study showed on 27 samples of local production and imported from water bottled 500 ml-5 liters it is unfit for human consumption. Razouqi and Al-Raawi (2010) examined the physical, chemical and biological properties of samples of local and imported bottled water in Baghdad.

Abudolabbas and Moussaoui (2015) conducted an assessment study of bottled water in some of the Middle Euphrates governorates. These include pH, total soluble salts, chloride, magnesium, calcium, nitrates, sulphates, and sorghum. The research aims to evaluate some samples of bottled water in Diwaniyah markets consumed by the citizen by comparing the results with the Iraqi specifications for drinking water and comparing the results of the sample examination with the specification mentioned on the packaging by the producer.

MATERIALS AND METHODS

Sampling : 9 types of bottled water were collected in local markets in different sizes with 3 samples of each type. The study included investigation of bacterial contamination as well as some physical and chemical properties of these samples. These samples are: (Al-Rawdatain, Manar, Lojin, AL-Thaghar, Sawa, Alwaha, Nawar, Al-Khaleej and Albakhera) in different sizes. The

Table 1 :

Samples	pH	TDS	TH	Ca ⁺	Ma ⁺	Cl ⁻	SO ₄ ⁻	Number of <i>E.coli</i>
Lojin	7.5	150	62	112	11.2	45	25	2
AL-Thaghar	7.8	140	40	128	19.7	56	22	15
Sawa	7.4	200	66	144	17.4	48	15.9	5
Alwaha	7.2	210	90	88	18	45	77.3	1
Manar	7.7	200	100	104	3	31	30	0
Rawdatain	7.5	220	140	152	5	14	60	0
Nawar	7.5	130	80	152	16.1	35	68	5
Al-Khaleej	7.4	140	48	128	17.9	56	40.8	2
Albakhera	7.7	150	52	112	13.4	42	57	2

samples were taken directly to the laboratory and the tests were carried out.

Biological tests

The tests included the calculation of the total number of colon coliforms by the method of casting dishes using Nutrient agar medium and Macconkey agar (AOAC, 2005).

Physical and chemical tests

These tests were carried out as follows :

1. pH was measured using a pH-meter after calibrating it.
2. Total dissolved salts (TDS) were measured using the measuring device after calibrating it with mg / L alone.
3. Total precipitation, calcium, magnesium, chlorides and sulphates were measured in the correction methods (APHA, AWWA and WFF, 2005).

RESULTS AND DISCUSSION

The results of the Table 1 indicate that the pH value tends to light basal. Since all the studied samples from Iraqi waters except the sample of the water of Rawdatin is Kuwaiti, so the Iraqi water tends to be basal because the soils that pass through the water are rich in salts. Basal characteristics. Hassan (2004) and the highest value is 7.8 for the water of the AL-Thaghar and the lowest value was the oasis 7.2. All the samples studied were in accordance with the Iraqi standard for drinking water (6.5-8.5) and this corresponds to the arrival of Musawi and Zubaidi (2010).

As for the total soluble salts TDS, the highest value was 220 water of Rawdatin and was identical to what was mentioned on the packaging of the specifications of either the minimum value was 140 for each of the water and the Al-Khaleej and all samples were the results did not match, what is stated on the packaging, but it was in accordance with the Iraqi standard drinking water 500 mg/L.

The hardness is an expression of the water content

of elements such as magnesium, calcium and others which are important properties of water and have a major role in all uses of water such as drinking, industry, agriculture and others (Cech, 2003). The highest recorded value was 140 mg/l for water Rawdatin and the lowest value was 40. Of water is due to the difference of soils and geological characteristics of the soil through which the water passes. It is noted that all the samples were very high in value compared to what has been mentioned in the containers except the water of the soil. However, all the values of the acidity recorded in the samples within the Iraqi standard of drinking water 500 mg/l, so Y. Be to say that this water is safe for consumption for ten.

As for the chloride ion of the above results, it is noted that the highest value recorded in the waters of the AL-Thaghar and the waters of the Al-Khaleej as it amounted to 56 mg / l and the lowest value was filled with water Rawdatin packaged if it reached 14 mg / L and these values are in accordance with the limits of standard Iraqi and global bottled drinking water and specified 200 mg / L, although most of these values do not match what is mentioned in the package. And ion chlorides of negative ions that gain water salty taste, especially when associated with sodium bion or calcium, the presence of chloride ion in large quantities lead to large industrial damage and affects the plants and contains household and industrial waste a lot of chloride ion (Health Canada, 1996).

Calcium ion is an important ion for human and plant health and works to reduce the harmful effects of sodium ions and is important in the formation of hardness. Generally, Iraqi soils are calcareous, which makes the water rich in calcium ions as well as various civil activities that help increase this ion in water (Abawi and Hassan, 1990). The highest value was in the water of Rawdatin and Nawar water, which reached 152 mg/L and the lowest value of the water of the oasis was 88 mg/L and all the values in the studied samples were acceptable within the Iraqi standard for drinking water 200 mg/L. It is noted that what was mentioned on the packaging was very little

compared to the values, we reached in the results of this research.

Magnesium ion has an association with calcium ion and has a major role in water hardness (Abed and Alwakeel, 2007). Of the above results, it is noted that the highest value of this ion recorded in the waters of Manar 3 mg/l and the highest value of water AL-Taghar 19.7 mg/liter, although the values stated on the water bottles do not match the results obtained except water Rawdatin and water Manar were identical All values shown are acceptable within the limits of the Iraqi Standard for drinking water 50 mg/l.

For the ionic sulphate, ion, which causes constant water hardness and is low solubility, it is present at night in surface water (Abawi and Hassan, 1990). The results of the research show that the highest value of sulphate ion is 77.3 mg / L of oasis water and the lowest value of water was 15.9 mg / L It is noted that what was mentioned on the packaging of the results were much lower than the current results, but all the results were within the limits allowed within the Iraqi standard of drinking water.

As for the biologic tests conducted for the total number of colon bacteria, most of the samples contained bacteria and in a small number, except for samples of water and al-Manar and Rawdatain and, it is assumed that there is no bacteria in drinking water according to international standards, but according to Iraqi specifications 5 samples were allowed according to the Iraqi standard clean water Bacteriology other than the water of a hole, if it contains 15.

CONCLUSION

1. In most samples the measured standards were greater than indicated on the bottle.
2. All samples from the physical and chemical terms were in accordance with Iraqi and international specifications.
3. the emergence of biologic contamination in many of the studied samples.

4. We recommend to increase the study on all types of bottled water in the market. This study includes all pollutants such as dioxin and others.

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