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ABSTRACT

This study was done to investigate two types of drinking water of the Sudan (tap water and mineral water) in Khartoum state in the period from June 2006 to August 2007.

The tap water was randomly collected from homes and universities. Samples were subjected to microbiological, physical and chemical examinations and analyzed to investigate the level of expected health hazards in each sample.

A total of fifty samples were collected from three sites in Khartoum State 9 samples of them were collected from three food factories (raw water, post – treatment water , post – filling water) , 15 samples were taken from mineral water from supermarkets ,18 samples were collected from tap water and thermal bricks coolers in some Universities of Sudan.

The results obtained were compared with national and international drinking water guidelines in an attempt to evaluate the quality of drinking water in Khartoum State.

The results indicated that all samples were free from *E.coli* but some of tap water samples were found to be contaminated with *Streptococcus spp.*

Again the results obtained indicated that some of the samples were contaminated with *Salmonella spp* and the contaminated tap water samples were more than contaminated mineral water samples.

The results obtained indicated that the turbidity level in tap water in Khartoum state ranged 5.4-13.6 NTU.

The concentration of minerals such as calcium in tap water is in the ranged of 22.25-31.85 mg/l and in mineral water is in the ranged of 14.43-14.73 mg/l , sulphate in tap water is in the ranged of 0.25-17.75 mg/l, total

dissolved solids in tap water is in the ranged of 103.55-112.45 mg/l, in mineral water is in the ranged of 90.15-90.65 mg/l, total hardness in tap water is in the ranged of 65.50-100.85 mg/l , in mineral water is in the ranged of 64.80-67.55 mg/l, alkalinity in tap water is in the ranged of 85.50-95.50 mg/l , in mineral water is in the ranged of 65-80.50 mg/l, Fluoride in tap water is in the ranged of from 0.23-0.65 mg/l, in mineral water is in the ranged of 0.185-0.35 mg/l, magnesium in tap water is in the ranged of 7.585-10.86 mg/l, in mineral water is in the ranged of 7.02-7.39 mg/l, sodium in tap water is in the ranged of 7.65-16.49 mg/l, in mineral water is in the ranged of 9.82-13.03 mg/l , Potassium in tap water is in the ranged of 2.245-7.135 mg/l in mineral water is in the ranged of 1.135-2.59.

The results obtained indicated that the concentration of essential salts such as calcium and magnesium in tap water were found to be more than mineral water. This is may be due to softening of drinking water in food factories.

It may be stated that most samples collected were suitable for human consumption.

ملخص الدراسة

أجريت هذه الدراسة علي نوعين من مياه الشرب السودانية (مياه الصنبور ، والمياه المعدنية) لولاية الخرطوم في الفترة من يونيو 2006 حتي أغسطس 2007.

لقد تم أخذ عينات عشوائية من مياه الحنفية من المواقع السكنية والجامعات وأجريت عليها التحاليل الميكروبيولوجية والفيزيائية والكيميائية للتأكد من صلاحيتها للإستهلاك الآدمي .

أخذت 50 عينة عشوائية لإجراء الإختبارات عليها منها 9 عينات من مصانع الأغذية تم أخذها من ثلاثة مواقع في المصنع (1- الماء الخام 2- بعد المعالجة 3- بعد التعبئة)، و 15 عينة أخذت من المياه المعدنية من المحلات التجارية، و 18 عينة تم جمعها من مياه الصنبور ومبردات الطوب الحراري في بعض الجامعات السودانية.

أشارت نتائج الدراسة ان كل العينات خالية من بكتريا القولون البرازية بعض العينات من مياه الصنبور وجدت ملوثة ببكتريا الاستربتوكوكس.

كما أوضحت الدراسة أن بعض العينات ملوثة ببكتيريا السالمونيلا . ووجد أن هذا التلوث في مياه الصنبور أعلي من التلوث في المياه المعدنية .

وكذلك أوضحت الدراسة أن مستوي العكارة لمياه الصنبور في ولاية الخرطوم تتراوح 5.4 -13.6 وحدات عكارة.

وأظهرت الدراسة أيضا أن نسبة تراكيز الكالسيوم لمياه الصنبور 22.2-31.85 ملجم/التر وللمياه المعدنية 14.43-14.73 ملجم/التر والكبريتات لمياه الصنبور ما بين 0.25 -17.75 ملجم/التر والمواد الصلبة الذائبة في مياه الصنبور بين 103.55-112.45 ملجم/التر

وللمياه المعدنية 90.15 - 90.65 ملجم/التر والعسر الكلي لمياه الصنبور 65.50-
100.85 ملجم/التر وللمياه المعدنية, 64.80-67.55 ملجم/التر والقلوية الكلية لمياه
الصنبور 85.50-95.50 ملجم/التر وللمياه المعدنية 65-80.50 ملجم/التر و الفلور في مياه
الصنبور 0.23-0.65 ملجم/التر وللمياه المعدنية 0.185-0.35 ملجم /التر و الماغنيسيوم في
مياه الصنبور 7.585 - 10.86 ملجم/التر وللمياه المعدنية 7.02-7.39 ملجم/التر و الصوديوم
في مياه الصنبور 7.65 - 16.49 ملجم/التر وللمياه المعدنية 9.82 - 13.03 البوتاسيوم في مياه
الصنبور 2.245 - 7.135 ملجم/التر و للمياه المعدنية 1.135-2.59 ملجم/التر. وكل هذه القيم
اقل من الحدود المسموح بها في موصفة هيئة الصحة العالمية والهيئة القومية للمواصفات والمقاييس
السودانية.

أيضاً أوضحت الدراسة أن أملاح الكالسيوم والماغنيزيوم في ماء الصنبور أعلى من تركيزها في الماء
المعدنية وربما يعزى هذا إلي عملية التيسير المتبعو في مصانع الأغذية.
تمت مقارنة النتائج بالخصائص العالمية والمحلية لتقييم صلاحية مياه الشرب بالولاية ووجد أن معظم
العينات المختارة صالحة للإستهلاك الآدمي .