

الآية

قال تعالى :

أَلَمْ تَرَ أَنَّ اللَّهَ أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ
ثَمَرَاتٍ مُخْتَلِفًا أَلْوَانُهَا وَمِنَ الْجِبَالِ جُدَدٌ بَيَضٌ
وَحُمْرٌ مُخْتَلِفٌ أَلْوَانُهَا وَغَرَابِيبُ سُودٌ ﴿٢٧﴾

وَمِنَ النَّاسِ وَالْدَّوَابِّ وَالْأَنْعَامِ
مُخْتَلِفٌ أَلْوَنُهُ، كَذَلِكَ إِنَّمَا يَخْشَى اللَّهَ
مِنْ عِبَادِهِ الْعُلَمَاءُ إِنَّكَ اللَّهُ عَزِيزٌ غَفُورٌ ﴿٢٨﴾

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صدق الله العظ

DEDICATION

To my family

To my father spirit

To my mother

To my Friends

Ibrahim

ACKNOWLEDGEMENTS

My praise and thanks go to "Allah" who gave me health and strength to make this work.

I wish to express my deepest gratitude to my supervisor Dr. **Mohammed El-Mukhtar Abdel-Aziz** for his guidance, advice, criticism, encouragements and insight through the work.

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ABSTRACT

The objective of this work is to assess the quality of El-Malha Crater (Padala) well water. For comparison, samples of water were collected for analysis, not only from El-Malha Crater (Padala) well, but also from neighboring wells at El-Malha area: Terrol, Black Toll, and El-Malha Old Donkey.

Physical and chemical properties as well as concentrations of some cations and anions were determined. The water quality assessment was carried out by comparing the results obtained with the Standards of Chemical and Physical Quality of Drinking Water.

The analysis showed that the color of the studied water sample (dark brown) was due to the presence of some transitional metals ions such as iron (1.053mg/l) and manganese (0.057 mg/l); the strong odor was due to the concentration of chemicals such as organic and some inorganic (sulfur and its compounds). The bitter taste was due to the presence of sulfate ion " SO_4^{2-} " (440mg/l) in the presence of calcium and magnesium, and salty taste was due to the sodium chloride.

It was found that some physical properties were considerably high, such as electrical conductivity (91000 $\mu\text{S}/\text{cm}$), and total dissolved solids (68.8g/l) which was due to the quantity of dissolved salts present. The pH-value of El-Malha Crater (Padala) Well water was high (9.7), and as such it could be described as alkaline water. The total hardness value was also very high (1950 mg/l) and as such it could be considered as most hard water.

The studied water sample was free from toxic metals such as lead (0.00mg/l), arsenic (0.0378mg/l), and selenium (0.0324mg/l), but it was contaminated with chromium (0.258mg/l), hydrogen sulfide (4 mg/l), and fluoride (105mg/l).

ملخص البحث

الهدف من هذا العمل هو تقييم جودة مياه بئر المالحة البركانية (بدالا). للمقارنة جمعت عينات المياه للتحليل , ليس فقط من بئر المالحة البركانية (بدالا), لكن أيضاً من الآبار المجاورة في منطقة المالحة : تيرول, تول الأسود, ودونكى المالحة القديم .

الخصائص الفيزيائية و الكيميائية بالإضافة الي تراكيز بعض الأيونات الموجبة والسالبة قد قدرت . قيمت جودة المياه بمقارنة النتائج المتحصلة مع مواصفات جودة مياه الشرب , الجودة الفيزيائية والكيميائية.

هذا التحليل وضح ان لون عينة الماء تحت الدراسة (البنى الداكن) بسبب وجود بعض الأيونات المعدنية الانتقالية مثل الحديد (1,053 ملجم/ل) والمنجنيز (0,057 ملجم/ل) , الرائحة القوية بسبب تركيز الكيمائيات مثل العضوية وغير العضوية (الكبريت ومركباتها) . الطعم المر بسبب وجود أيون الكبريتات (SO_4^{2-} 440 ملجم/ل) في وجود الماغنيسيوم والكالسيوم والملحى بسبب وجود كلوريد الصوديوم .

هنالك عدد من الخصائص الفيزيائية عالية بكثير, مثل الموصلية الكهربائية (91000 ميكروسيمنز) والأملاح الكلية الذائبة (68,8 جم/لتر) بسبب كمية الأملاح الذائبة الموجودة . قيمة الأس الهيدروجيني لمياه بئر المالحة البركاني (بدالا) كانت عالية (9,7) , مما يجعلها توصف بأنها مياه قلووية. قيمة العسر الكلي أيضاً كانت عالية جداً (1950 ملجم/ل), مما يجعلها بأنها تعتبر مياه شديدة العسر.

عينة الماء تحت الدراسة لا توجد بها معادن سامة مثل الرصاص (00 ملجم/ل), الزرنيخ (0378 و 0 ملجم/ل) , والسيليونيوم (0,0324 ملجم/ل), لكنها ملوثة بالكروم (0,258 ملجم/ل) , كبريتيد الهيدروجين (4 ملجم/ل) , والفلوريد (105 ملجم/ل) .

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GLOSSARY OF TERMS

Aquifer: Saturated zone containing sufficient ground water that water can be pumped out.

Dar: Tribal homeland.

T, I'DN – AA'L: Meidob Language or tongue.

Wadi: Seasonal water course.

WHO: World Health Organization.

UNEP: United Nations Environment Programme.

Jebel: mountain.

Jendaga: it is the name in the Meidob dialect, which is dark brown clay –like substances rich in minerals, that is eaten by livestock in the area.