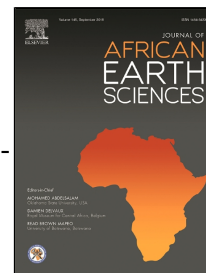


Accepted Manuscript

Identifying the origin of groundwater salinisation in the Sidi El Hani basin in central-eastern, Tunisia

Mnassri Soumaia, Dridi Lotfi, Lucas Yann, Schäfer Gerhard, Hachicha Mohamed, Majdoub Rajouene



PII: S1464-343X(18)30200-0
DOI: 10.1016/j.jafrearsci.2018.07.004
Reference: AES 3266
To appear in: *Journal of African Earth Sciences*
Received Date: 06 December 2016
Accepted Date: 04 July 2018

Please cite this article as: Mnassri Soumaia, Dridi Lotfi, Lucas Yann, Schäfer Gerhard, Hachicha Mohamed, Majdoub Rajouene, Identifying the origin of groundwater salinisation in the Sidi El Hani basin in central-eastern, Tunisia, *Journal of African Earth Sciences* (2018), doi: 10.1016/j.jafrearsci.2018.07.004

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **Identifying the origin of groundwater salinisation in the Sidi El Hani basin in central-**
2 **eastern, Tunisia**

3 Mnassri Soumaia ^{a*}, Dridi Lotfi ^a, Lucas Yann ^b, Schäfer Gerhard ^b, Hachicha Mohamed ^c
4 and Majdoub Rajouene ^a

5 ^aDépartement du Génie des Systèmes Horticoles et du Milieu Naturel, Université de Sousse,
6 Institut Supérieur Agronomique de Chott Meriem, BP 42, 4042 Chott Meriem, Sousse,
7 Tunisie.

8 ^b Université de Strasbourg, CNRS, ENGEES, LHYGES UMR 7517, F-67000 Strasbourg,
9 France.

10 ^c Institut National de Recherches en Génie Rural, Eaux et Forêts, BP 10, 2080, Ariana,
11 Tunisie.

12 * Corresponding author. Tel. : +216 96 714 748

13 Email.adress: mnassrisoumaya@yahoo.fr

14 Abstract

15 In the Sidi El Hani basin, located in central-eastern Tunisia, a shallow aquifer is the main
16 water source for agricultural practice. However, in the last few decades, it has undergone
17 saline pollution. In this context, this study is carried out to identify the origin of the dissolved
18 species and the processes involved in the increase of groundwater salinization using
19 hydrochemical tools and geochemical modeling with PHREEQC. To achieve this objective,
20 water analysis was performed on 49 samples collected from 46 shallow wells and 3
21 observation wells during March and April 2015. The results indicate that for the samples
22 located near the Sabkha Sidi El Hani, the dominant facies of the groundwater is sodium
23 chloride (Na-Cl). The water samples are characterised by high salinity exceeding 6 g.L⁻¹.
24 However, in the centre of the basin, the water samples are a mixed type (Cl-Na-SO₄-Ca-Mg).
25 Our results show that salinisation of the groundwater was due to the dissolution of halite,
26 cation exchange, and the precipitation of carbonate minerals such as calcite and dolomite
27 coupled with the dissolution of gypsum, and evaporation. Intensive irrigation in the area
28 leading leaching of salts from the surface soils to deep soil layers are additional factors. This
29 soil leaching is the major process that accounts for salinisation of water and soil; it leads to
30 the accumulation of a bitter brine solution after the precipitation of evaporite minerals.

Download English Version:

<https://daneshyari.com/en/article/8913383>

Download Persian Version:

<https://daneshyari.com/article/8913383>

[Daneshyari.com](https://daneshyari.com)