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Evolution and Mineralization of Water Chemistry in the Aquifer systems of the Terminal Complex of the Wadi Righ Valley

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Abstract

Groundwater resources in the Wadi Righ valley are represents an important part into the eastern basin of the Algerian Sahara. It characterized by a superposed of two main major aquifers: the former represented by the Intercalary Continental (IC) and the latter by Terminal Complex (TC). This study is focused on the quality aspects of water hosted into Terminal Complex which chow a multi-layers lithology. From a qualitative point of view, various studies have highlighted indicates that the waters in this region showed displays an excessive mineralization, including the waters of the Terminal Complex (EC= 5854.61 S / cm). The application of geochemical methods on applied to the analytical data obtained from wells in the region where the appurtenance of water car reach different layers of the water system of multi-layered aquifer waters of Terminal Complex of the Wadi Righ valley. Therefore, the linear correlations between the chemical elements were composition calculated and it indicates water composition which reflects the water and the lithological nature of different layers of the aquifer. It highlights also the connection between different formation, and predicts possible connection of water between three levels groundwater's in these's layers on one hand and it indicates the mineralization origin of water that represented by the influence highly influenced by various lithological formations. The results show that the mineralization of water is from geological origin. It concerns the composition of the layers that make up the Terminal Complex.

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Keywords: Terminal Complex (CT); Mineralization; Statistical Approaches; CHA ;PCA; wadi Righ; Algeria.

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1. Introduction

The Algerian Sahara is until now the subject of numerous many academic studies, scientific papers and technical reports. Among other theses studies were have focused mainly on geological and hydrogeological issues of their aquifers reconnaissance [4; 7; 8; 9; 12] and the aquifer system of the Northern Sahara. We denote that some investigations were various studies have also focused on the quality physicochemical and bacteriological sometimes, the waters of this aquifer system. They were able to estimate their potability and the ability for to irrigation, and therefore their impact influence on human health and the environment were identified. This study suggests some treatments for proposals, suited to the quality parameters to be corrected, and was performed [1; 2; 6; 11; 18; 23].

Nomenclature

TC	Terminal Complex
IC	Intercalary Continental

2. Presentation of studied

The valley of Wadi Righ is located on a fossil bed (Wadi-Igharghar) which is a wide ditch subsidence in South-North direction with a longitudinal slope of 1 ‰ south of El Goug to Chott Merouane northem (Fig. 1). The geological formations are mainly of aged of Quaternary they are age and representing the resulting from of erosion effect on the preexistent continental formations and deposits aged of continental Mio-Pliocene age deposits [5-22].

The climate of the region of Wadi Righ is of the hyper arid like the Saharan type, mild winters with a permanent drought therefore; with low and erratic rainfall and that hardly exceeding 60 mm / year in over during 39 years. The average maximum temperatures is around 40 ° C, while the cumulative annual evaporation is (2400 mm / year) exceeds almost more than 40 times that of rainfall.

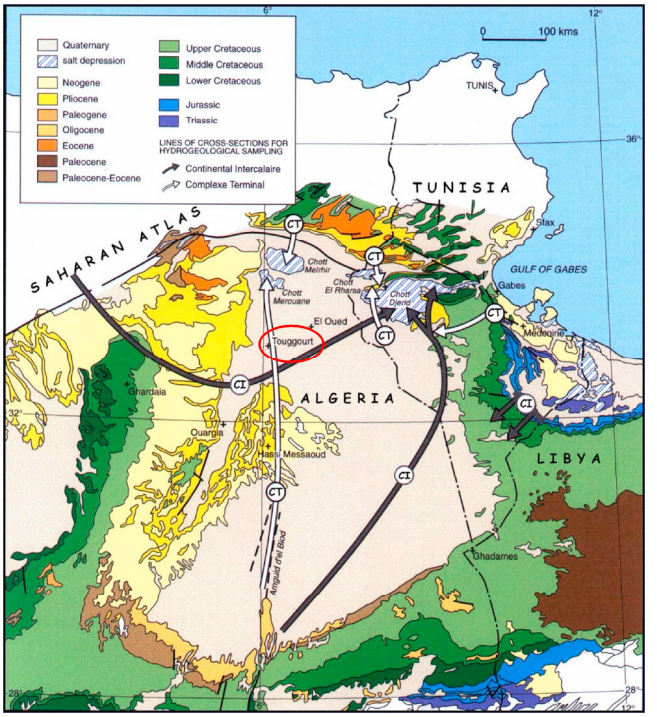

Figure 1. Geological levelling to Northern Sahara (Edmunds, 2004)