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MORPHOLOGICAL AND PHYSIO-CHEMICAL EVALUATION OF SOME SOILS IN THE WESTERN BACK OF SUEZ CANAL

BY

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This M. Sc. Thesis entitled "MORPHOLOGICAL AND PHYSIO-CHEMICAL EVALUATION OF SOME SOILS IN THE WESTERN BACK OF SUEZ CANAL" and submitted by ABD El-HALIM ABD EL-WHAB MOHAMED KHALIL has been supervised by the following Staff Members of the Department of Soil Science, Faculty of Agriculture, Menoufiya University and Soil, Water & Environment Research Institute, Agriculture Research Center.

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CONTENTS

1. INTRODUCTION

Food production continues to be one of the most pressing problems of Egypt as well as the rest of third world, due to the rate of population increasing. Desertic part represents about 94 % of the total area in Egypt.

Thus, land evaluation of the desert soils for agricultural purposes should not be limited to the kind of crops grown, but also to express the value of a piece of land for a certain use considering the sustainability aspect.

The pedogenetic studies is a trail to contribute and provide such knowledge to help in planning for proper agricultural land use program of the desertic soils. Accordingly it is rather essential to conduct the pedological studies as a step to evaluate their potentiality.

Consequently, the government is planning to install many facilities to expand the agricultural area, beside supporting research and development of the cultivated area to maintain their production at a feasible limit.

To fulfill the horizontal expansion aim, the desert soils are more concerned. Among these areas, the area that bounded by Suez Canal from the east, El-Sharkiya Governorate from the west, Ismaeliya Canal from the north and Adabia and Gabel Ataka from the south, is considered

The aim of the current study is to evaluate morphological, physical, chemical and mineralogical characteristics of the desert soils adjacent to both Suez and Ismaelyia Governorates. Classification and quantitative evaluation of these soils were also carried out. Accordingly, suitable suggestion could be attained to help in planning the reclamation technique and to understand how to deal with these soils for agricultural use.

2- REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

2.1. Geogensis of the soils:

The High Dam soil survey done by **FAO group (1964)** stated that all the soils located between Ismaeliya and Suez are very young, and differences in soil profile characteristics formed under climatic influences (pedogenesis) are very minor.

They added that the pronounced differences in soil properties are caused by differences in geological development (geogenesis), i.e. the influences of sedimentation and erosion. Such factors as the origin of the sedimentary materials; the means and length of transport, the conditions and environment of sedimentation, or the exposure and erosion of older formations, are more important in explaining the physical and chemical properties of these soils and their differences.

They showed that the only pedogenetic features seen, are some lime spots in the soil profiles and the presence of cemented soil horizons formed by gypsum. Gypsum pans have been observed and many Miocene and other geological formation are rocky in the surface just because of this kind of concentation. These formations principally consist of soft limestone, marl and shaly clays, but all very rich in gypsum.

They noted that in the northern part, sandy and fine or only slightly gravelly Pleistocene Nile deposits prevail, for the greater part which are probably deposited in a shallow sea water. Wind-blown sands derived from these deposits occur, most of them still shifting under the influence of the wind.

Further to the south the soils of the out wash plains and wadi plains are also young from a point of view of soil formation.

The soil material is of local origin and very rich in gypsum. The soils are shallow, overlying older gypsiferrous formations, often marly or consisting of shaly clay.

The same authors showed that wadi plain soils of Wadi El- Bahara, close to Suez show the influence of the sea in the presence of sea shells in the profile and on the soil surface; some what closer to the Gulf the coarse textured gypsiferrous wadi plain soils become poorly drained saline coastal clay soils.

The geologic map of the area and its hinterland show three main geological formations: Fig. (1).

Tp_1. the recent and Pleistocene deposits which occupy the northern part between Wadi Ashara, and which extend as far east as the Suez canal and south ward to the Gulf of Suez only locally small area of Miocene formation is occurred.

Tm. the Miocene formation which occupies most of the area to the west, with many Oligocene and possibly some lower and upper middle Eocene out crops.

Te. The middle Eocene formation which is exposed in Gabel Ataka:

The area of eastern site of Nile Delta is totally occupied by sedimentary rocks belonging to the Tertiary and the Quaternary epochs, **(Ball, 1939; Said, 1962; El-Fayoumy, 1968 and Abu Al-Izz, 1971).**

2.2. Geomorphology:

According to **Ball (1939) and Abu Al-Izz (1971),** the Eastern Desert of Egypt is characterized by a group of geomorphic features that make it basically different from the western desert.

Also, **Said (1962) and Shata (1978),** indicated that the landforms recognized in the area of East Nile Delta, are the alluvial fans, the out wash