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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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بالرسالة صفحات لم ترد بالأصل

بعض الوثائق الأصلية تالفة

STUDY OF SOME HEAVY METALS AND MICROCONSTITUENTS IN FRESH AND SALINE WATERS

Thesis

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CONTENTS

Chapter I

INTRODUCTION

As the most well known river of the ancient world, the Nile is still an interesting river of the present time. It plays an important role in the life of the people in east, central and north Africa through transport, power, irrigation, drinking water, tourism and fishing.

In Egypt, the Nile is considered as the nerve of life or the whole life and prosperity of the country . The river provides Egypt with 98 % of its water supply. The amount of water available to Egypt is 55.5 billion m^3 / year which makes the share of each egyptian 4 m^3 / day (Said[1], 1981).

The Nile has a length of 6825 km, starting from the sources of the Luvironza River in Tanzania to the shores of the Mediterranean. The river follows generally a south to north path both its source in Equatorial Africa and its mouth in the Mediterranean Sea lie within one degree on the same meridian of longitude. It crosses 35 degrees of latitude, drains an area of close to 3,000,000 km^2 and connects regions which differ from each other in relief, texture, climate and geological structure .

The Nile water runs-off the tropical hill sides of central east Africa and collects into little streams, then into hundreds of little riverlets which find their way into the Sobat, Blue Nile and Atbara, and, finally into the Nile which proceeds northwards through the rainless wastes of the egyptian desert.

Of the total course of the Nile, only the terminal 1530 km lie

within the borders of Egypt. The Nile from Aswan to Cairo runs about 973 km. A little to the south of Cairo, the Nile valley opens into the delta. The delta tributaries are the western Rosetta branch, about 239 km long, and the eastern Damietta, about 6 km longer.The Rosetta branch receives even today more than 70 % of the water of the Nile as it bifurcates into the delta fan (Said[1],1981). It is apparent that water chemistry is closely allied to the geology and the biology of aquatic habitats (Cole[2],1979).
According to Quelennec and Kruk[3] (1976) and Emelyanov et al[4]. (1978), the average composition of the Nile alluvium is about 25 % sand, 45 % silt and 30 % clay. The chemistry of the Nile alluvium reflects its mineral composition. The dominant major chemical components are : allumina, silicates, calcium carbonate, organic matter, sodium, potassium, iron, manganese and titanium.

The Nile sediments are of terrigenous type composed of fine rock fragments, weathered particles of clayey aggregates. They are enriched with a certain association of trace metals such as : chromium, copper, zinc, nickel, zirconium, vanadium and cobalt. From the average content of these elements in the sediments and considering that the Nile dumped 120 million tons /year in the Mediterranean, Emelyanov et al[4].(1978) calculated the mass of these elements which are delivered to the Mediterranean annually as

follows : calcium carbonate, carbon (organic), iron, manganese, titanium, sodium, potassium : 7, 1.43, 7.1, 0.13, 1.48, 1.46, 1.2 million tons /year, respectively, and of the trace elements chromium, copper, zinc, nickel : 16.2, 6.2, 12.9, 15.1 thousand tons /year, respectively.

The sediment yield was estimated to be 88 - 120 million tons /year (Holleman[5], 1968 & Aleem[6], 1972) and the losses of the Nile water into the sea were amounted to be 100 billion m^3 /year during the flood season (August-October) before the construction of the oldest Aswan Dam in 1902 (Draz[7], 1983). After the construction of the High Dam (1965), most of the Nile water and its silt materials were stored behind the dam.

AREA OF INVESTIGATION

The investigated area -Rashid estuary- at the northern end of the Nile Rosetta branch, extends from Edfina barrage to the outlet Fig. (1).

Dyer[8] (1972), defined the estuary according to Pritchard[9] (1952), as a semi-enclosed coastal body of water having a free connection with the open sea and containing a measurable quantity of sea salt. From the previous definition and since estuaries are generally known as areas in which fresh water is appreciably mixed with saline water, the term "estuary" can thus be retained for the investigated area of the Rosetta branch.

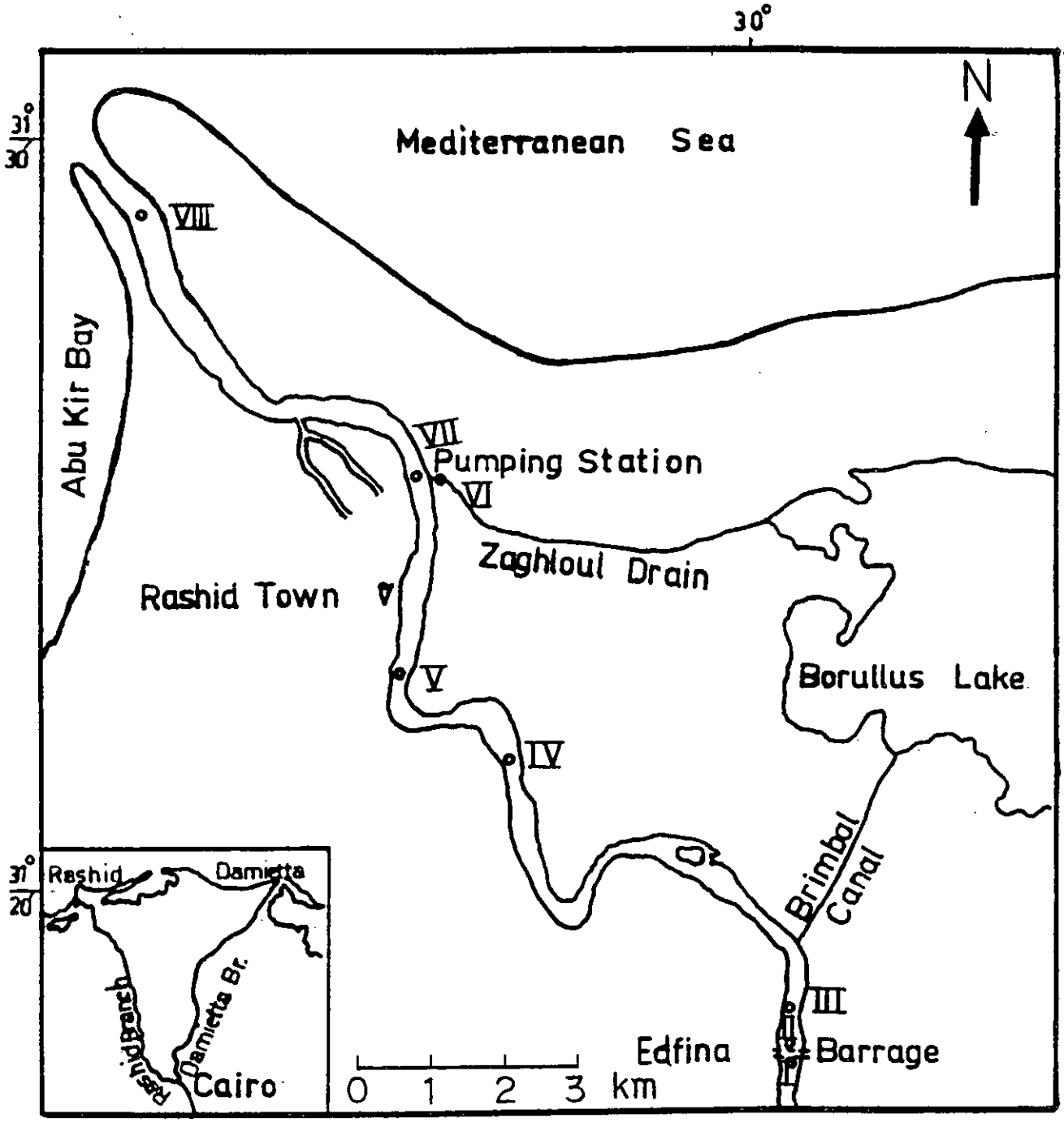

Fig. (1) Rashid estuary and position of sampling stations.