

Holocene Landform Evolution at the South of Lake Idku, Northwest Nile Delta, Egypt, Reconstructed from Settlement Location and Sediment Cores

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1. Background & Objective

The Nile Delta has been formed in the mouth of Nile River, northern Egypt. It is said that Nile Delta started to be formed at 7,000 yr BP when due to the decline of the speed of the worldwide sea-level rise in post-glacial age sediment supply carried by river was piled in the depositional space (Stanley and Warne, 1994). And in the case of Nile Delta, sea-level has been still rising in 1,000-year order and now it's highest since post-glacial age caused by a compressive settling of delta deposits (Warne and Stanley, 1993). Besides it is a zone of arid environmental conditions called desert climate. Therefore, Nile Delta has been modified complicatedly by various forms of depositions; fluvial, marine and aeolian. So it is significant to examine the micro-topography using higher resolution.

This study focused on specific site and aimed to reconstruct landform evolution from analysis of three sediment cores drilled by Cairo Univ. in 2012 and settlement location.

2. Study Sites & Methods

This study focused on the site of Lake Idku in the east of the Rasheed branch. There is a Roman archaeological site named Kom al-Diba'a in low land in the south of Idku. It's located two slightly elevated flat hills which are about 6-8m high and 150-300m across. In this thesis the following methods were used ; landform classification by satellite photography using GIS software, field investigation of the study site, sedimentary facies analysis, soil color analysis, magnetic susceptibility analysis, grain size analysis, elementary analysis, 14C dating.

3. Result & Discussion

Geomorphology and Geology of Kom al-Diba'a

By investigation of Kom al-Diba'a outcrop and sample analysis; magnetic susceptibility analysis and grain size analysis, it is found that two slightly elevated flat hills are eolian sand dunes consisting of well-sorted medium-fine sand. Besides, the upper part of the south hill's outcrop is alternation of sand and silt which is assumed to be flood deposits.

Geomorphological Changes in the area of Lake Idku

As a result of analysis about a sediment core drilled in former lagoon site of Lake Idku, it can be divided into the following three stages and estimated sedimentary age; AB-boundary: 3000-4000 yrBP, BC-boundary: 1500-2000 yrBP. Thus, geomorphological changes in the area of Lake Idku were reconstructed by these three stages. Thus, geomorphological changes in the area of Lake Idku were reconstructed by these three units.

A: Idku was connected to the Mediterranean Sea as a gulf. It was a depositional situation by inflowing of beach ridge sediments due to waves or small transgression and of flood deposits transported by the Nile. (Sand layer and element fluctuation)

B: Idku was expanding especially to the east side caused by a compressive settling of delta deposits and flooded land area reduced in consequence. (Reduction of sand layer and element fluctuation)

C: Idku was unconnected to the Mediterranean Sea due to beach ridge sediments transported from the mouth of Rasheed branch by coastal current. (Decline of sulfur concentration)

[References]

Stanley, D.J. and Warne, A.G. (1994): Worldwide Initiation of Holocene Marine Deltas by Deceleration of Sea-Level Rise. *Science*, 265: 228-231.

Warne, A.G. and Stanley, D.J. (1993): Archaeology to refine Holocene subsidence rates along the Nile delta margin, Egypt. *Geology*, 21: 715-718.

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