



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

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"Structural study of the area southwest of Gebel Akheider, Cairo-Suez District, Egypt"

A thesis submitted
In partial fulfillment of the requirements for the degree of Master of Science
in Geology

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Note

The present thesis is submitted to the Faculty of Science, Ain Shams University in partial fulfillment of the requirements of the Master degree of Science in Geology. Besides the research work materialized in this thesis, the candidate has attended eleven post-graduate courses for one academic year as follows:

1. Advanced Structural Geology
2. Geotectonics
3. Field Geology
4. Geostatistics
5. Geomorphology
6. Photogeology
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ABSTRACT

Detailed field mapping (scale 1:20.000) of the area located to the southwest of Gebel Akheider, central part of the Cairo-Suez district, was carried out. The area of study is about 210 square kilometers and extends from latitudes 29° 38' to 29° 45' N and longitudes 31° 59' to 32° 12' 30' E. The aim of this study is to focus on the structural evolution of the area and the relationship between the structural deformation and deposition of the Oligocene sediments.

Faults affecting the study area exist in three main sets; northwest-southeast, east-west, and west-northwest-east-southeast. These faults have an echelon arrangement with similar throw directions (e.g. Wadi Esseimer and Wadi Elshona en echelon normal faults) or opposite throw directions (e.g. Gebel Akheider horst and Wadi Esseimer and Wadi Akheider grabens). The en echelon normal faults are believed to have been formed by right-lateral divergence on deep-seated faults. This caused extension in the northeast to north-northeast direction that formed the northwest and west-northwest oriented faults after the Late Eocene and before deposition of Oligocene sediments. These en echelon faults are responsible for the development of east-west to northwest oriented horsts and grabens in the study area (e.g. Gebel Akheider horst and Wadi Esseimer graben). The northwest – southeast and east – west deep-seated faults have been rejuvenated after the Late Eocene-before deposition of Oligocene sediments. The northwest – southeast faults were rejuvenated by dextral slip that was also reactivated by synchronous with the east – west faults with strike-slip movement (right-lateral). During the Miocene, the northwest-southeast faults were also rejuvenated with dextral offset. Repeated rejuvenation affected the two main fault sets that became connected in some parts of the study area into a zigzag

fault pattern. This study revealed the dominance of extensional tectonics after the Late Eocene and before deposition of the Oligocene sediments of the area. Extension continued during the deposition of the Oligocene sediments. Upper Eocene rocks were eroded in the structurally high areas and Middle Eocene rocks were unconformably overlain by Oligocene rocks. Regional northeast – southwest extension during the Late Oligocene time responsible for the opening of Gulf of Suez led to extrusion of basaltic lava through the pre-existing northwest-trending fractures (black cone of the basaltic intrusion of Gebel Akheider). This tectonic event rejuvenated the northwest-trending faults as indicated by their silicification (Oligocene quartzite) in several parts of the study area through uprising of hydrothermal solution and basaltic lava along fault surfaces.

Keywords: Oligocene deformation, Gebel Akheider, Cairo-Suez district, Eastern Desert, Egypt.

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