CHAPTER 1

INTROUDUCTION

1.1. General statement:

The Pan-African rocks are of widespread distribution throughout the Arabian-Nubian Shield. It is believed to represent the period during which the accretion of various terranes to form Gondwanaland took place.

The basement complex of Egypt represents the northwestern segment of the Arabian-Nubian Shield. The development of the Pan-African mobile belt of the Arabian-Nubian Shield is currently interpreted within the framework of plate tectonics. This shield is one of the best-documented examples of the Pan-African (Late Proterozoic), crustal evolution through processes of island arc accretions **(Engel et al., 1980; Roobol et al., 1983; Stern and Hedge, 1985; Kröner et al., 1988 and El Ramly et al., 1993).**

Others considered that the crustal growth of the Arabian-Nubian Shield apparently occurred as arc and back-arc basin systems coalesced into protocontinental (terranes), which were sutured together **(Gass, 1981 and 1982; Kröner 1985 and Stoeser and Camp, 1985).**

Gass (1981 and 1982) suggested that, the upper Proterozoic to lower Paleozoic continental crust of the Arabian-Nubian Shield evolved through a period of about 750Ma (1200-450 Ma) by progressive cratonization of numerous intra-oceanic island arcs that formed by magmatic, metamorphic and sedimentary processes above destructive plate margins. Structural deformation and ophiolite obduction occurred primarily during phases of arc-collision at about 1000, 800 and 600 Ma.

Kröner et al. (1987) suggested that the Pan-African structural domain with its ophiolitic mélange and low-angle thrusts extends almost as far west as the Nile River, where the margin of the ancient African craton may be found. The

entire domain farther east is characterized by newly accreted magmatic associations of Late Precambrian age which might have evolved, in settings similar to those presently observed in the Indonesian archipelago.

Greiling et al., (1994) believed that the Gabal Gerf nappe was linked with the Barramiya nappe complex pre-dating a WNW tectonic transport of about 300 Km along Wadi Kharit-Wadi Hodein suture.

The present thesis is concerned with an important area of the South Eastern Desert, namely Wadi Kreiga-Wadi Kurbiyay area, which in contact with the biggest nappe of ophiolitic mélange in the Eastern Desert of Egypt (Gabal Gerf). On the other hand, the inaccessibility of this area might have been the reason for its limited appearance in the geological literature.

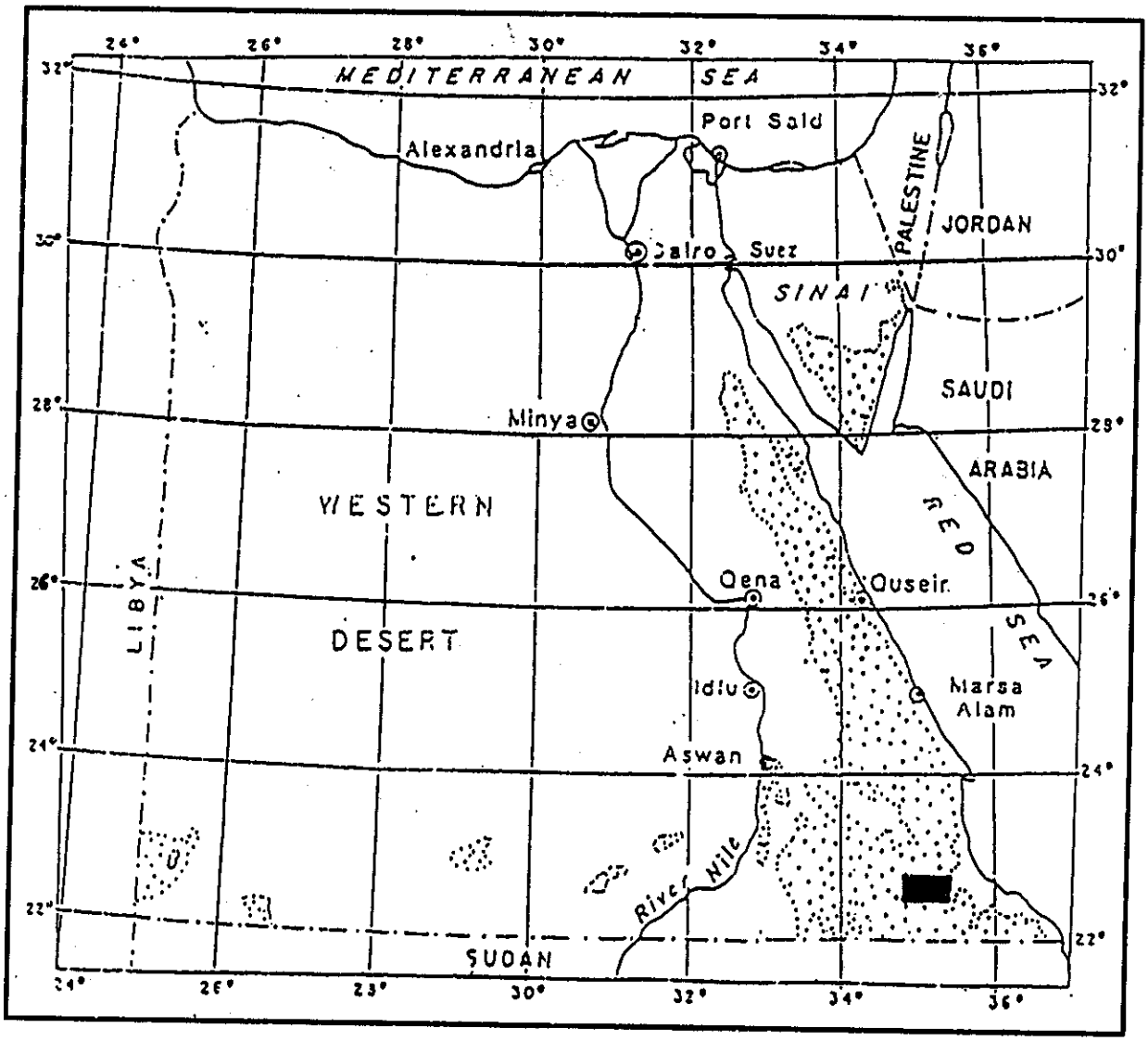
Therefore, this area was chosen as a subject for the present thesis in order to clarify the petrogenesis and tectonic setting of the different rock-types within this area.

1.2. Location, Delineation and Accessibility:

The area under investigation is a part of the exposed Pan-African basement in the South Eastern Desert of Egypt, and lies within the limits of Elba Topographic Sheet (No.12) scale 1:500,000.

This area is delineated between latitudes 22° 45` 00`` and 22° 55` 00`` N and longitudes 35° 00` 00`` and 35° 20` 00`` E, covering an area approximately 690 Km^2 (Fig. 1). In the vicinity of the studied area the prominent site of El-Shalatin town about 50 Kms north east of the present area.

The area is accessible through, the Marsa Alam-Halaieb asphaltic road which running along the Red Sea coast. This road is connected with the desert track of Wadi Hodien and follow Wadi Kreiga westward to the eastern part of the studied area, or follow Wadi Madi to the western part of the area. Also the studied area could be reached through Wadi Shaa`b at the Km sign 20 south of El-Shalatin town.



(Scale 1 : 10,000,000)

Basement Rocks

Study Area

Fig. (1) : Key map illustrating the location map of the study area