

Permo-Triassic

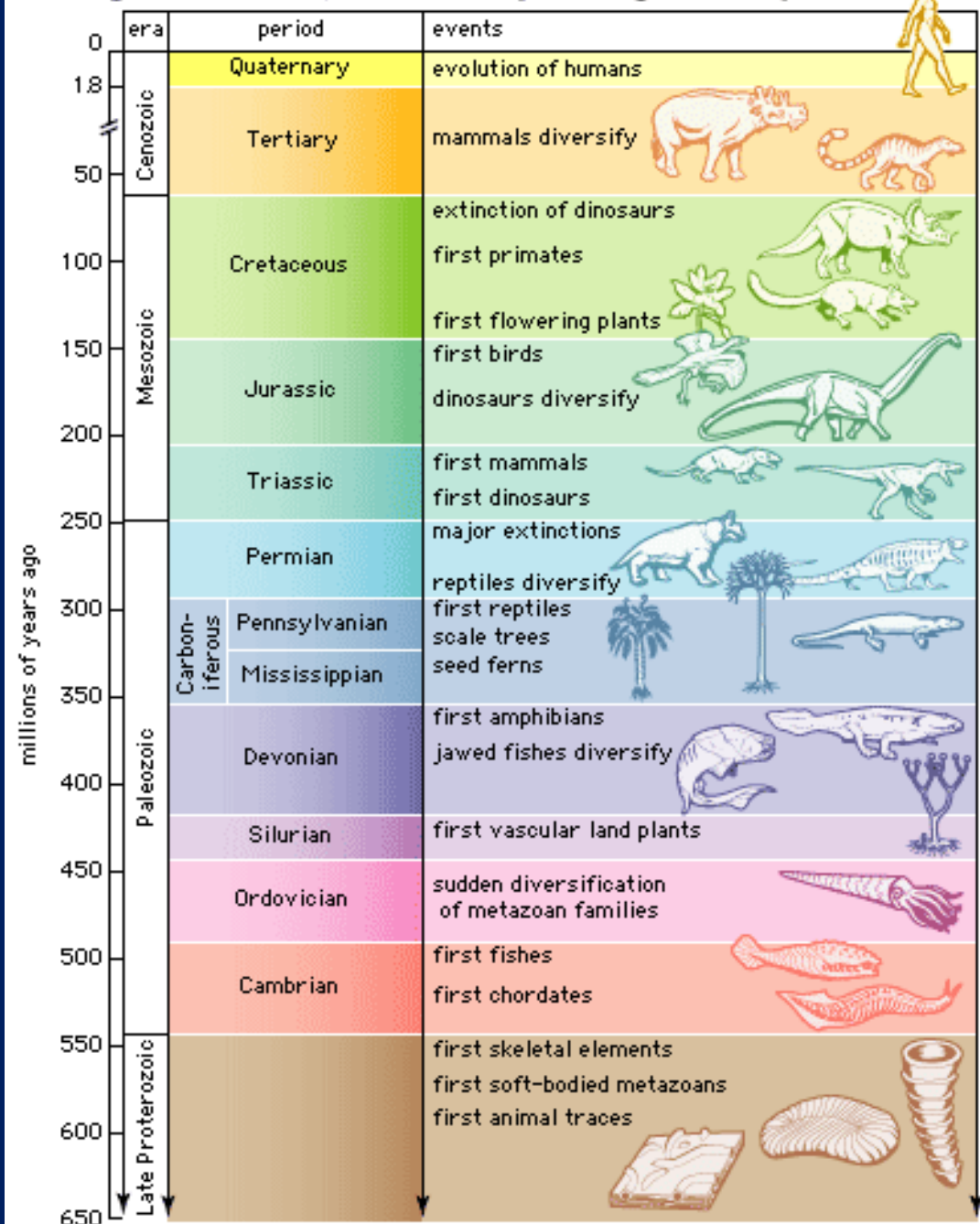
- Permo-Triassic
Rock units:

Qiseib Formation
Budra Formation

- Triassic Rock
units:

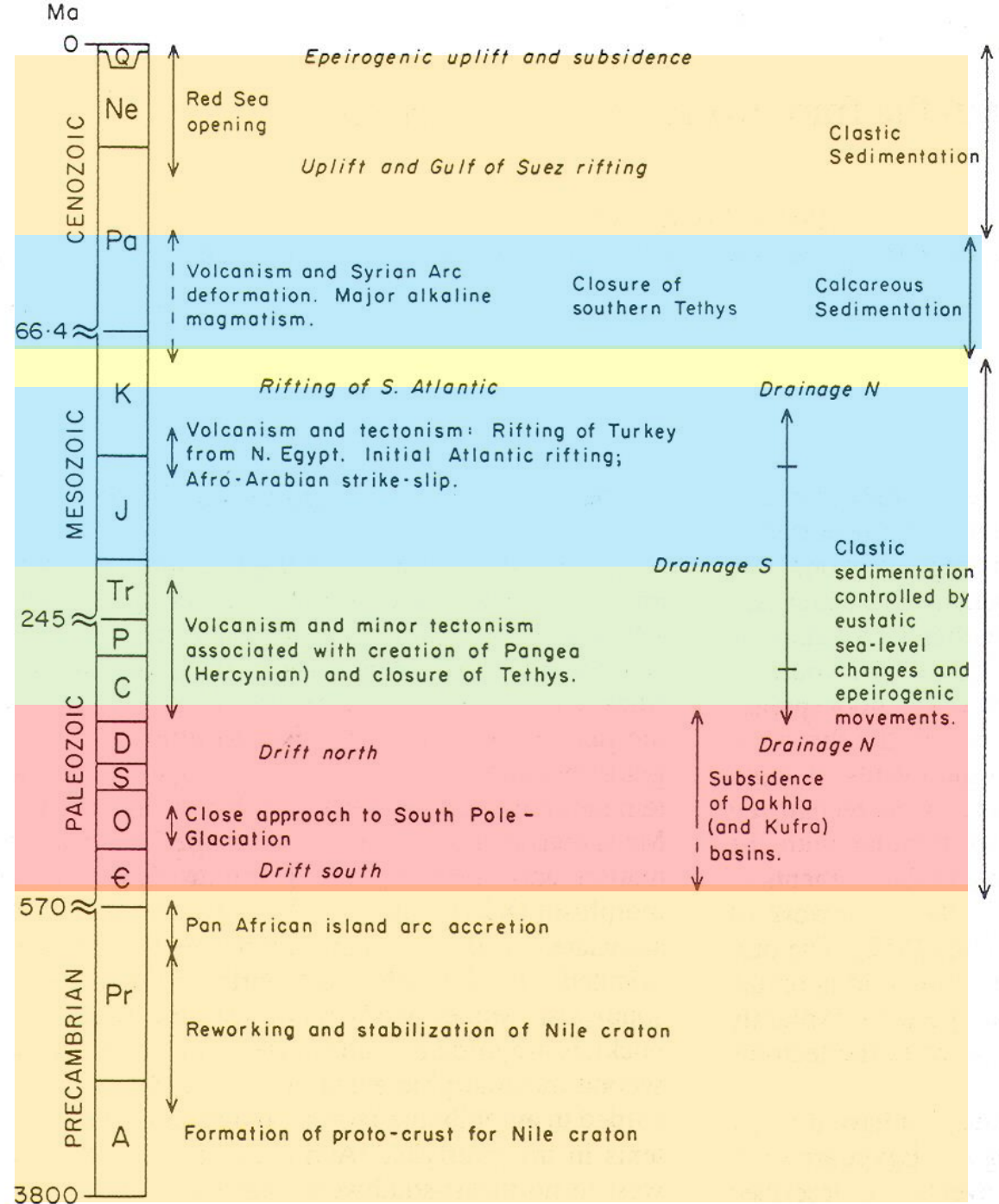
*Arif El Naga
Formation*

Geologic time scale, 650 million years ago to the present



Egypt in the framework of global tectonics

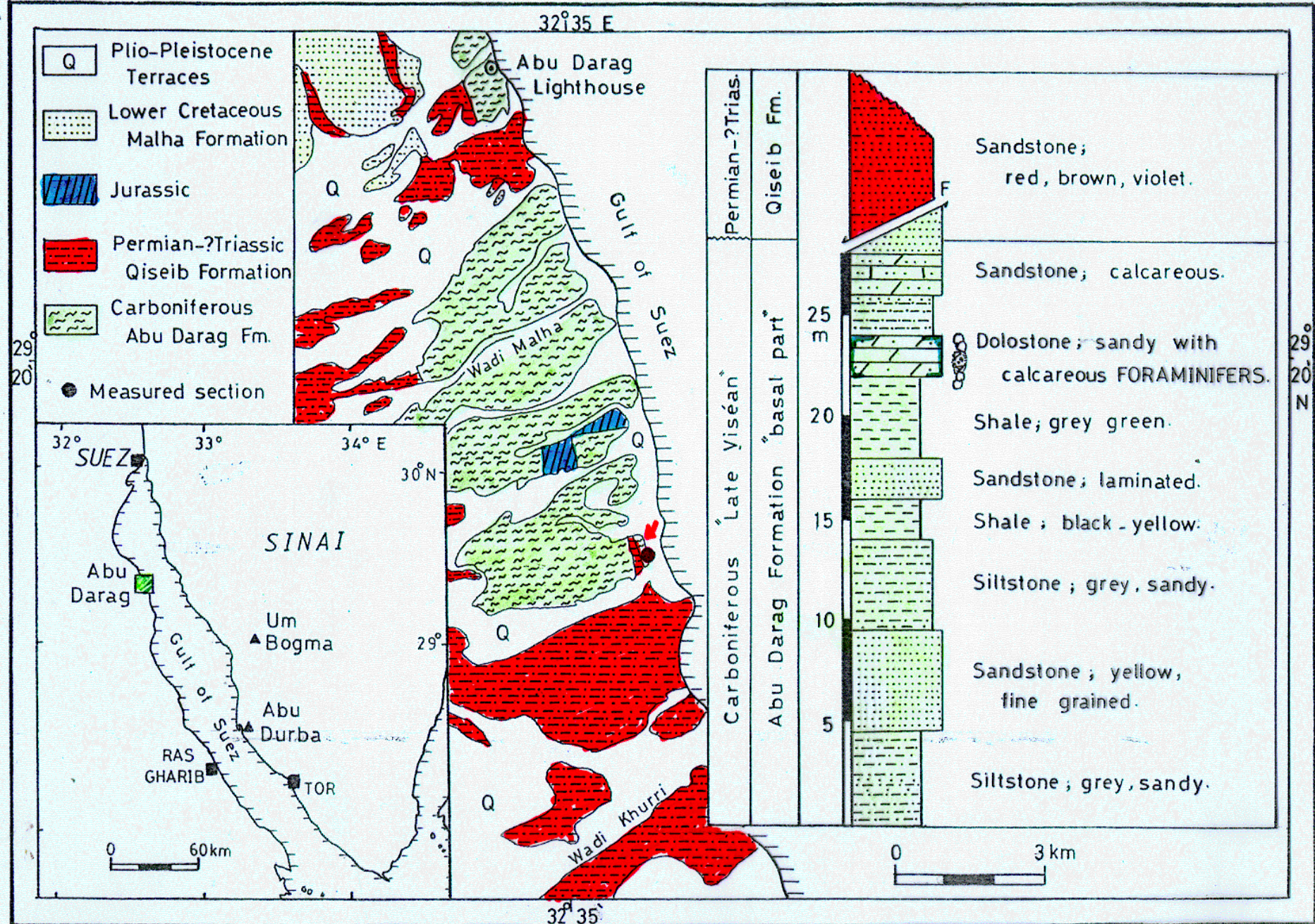
The New Red Sandstone is a chiefly British geological term for the beds of red sandstone and associated rocks laid down throughout the Permian (280 million years ago) to the end of the Triassic (about 200 million years ago) that underlie the Jurassic Lias; the term distinguishes it from the Old Red Sandstone which is largely Devonian in age.



Carboniferous – Triassic Hercynian orogeny:

The collision
between Gondwana
and the northern
continents and the
closure of Tethys,
with E-W trend
terminate the
Paleozoic trend.

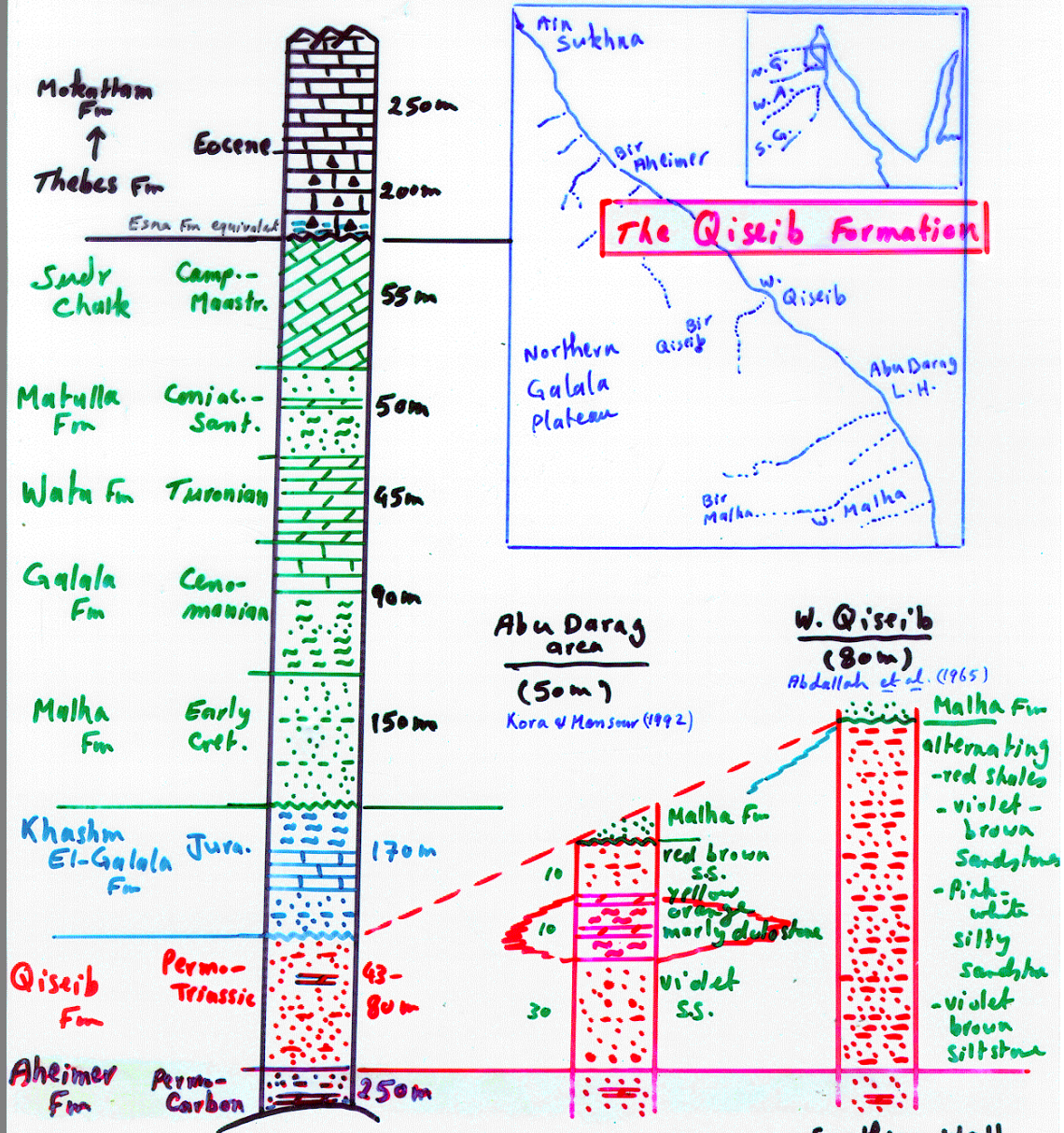




Kora: Text-fig. 2 Geologica et Palaeontologica

The Permo-Triassic red beds in the Gulf of Suez region:

a) Composite columnar section in the Northern Galala:





The Qiseib Formation:


Type locality: Wadi Qiseib, SE Northern Galala.

Thickness: 43-80 m.

Lithology: Red shale-siltstone-sandstone, with a yellow-orange fossiliferous dolostone tongue in the middle at Abu Darag locality.

Boundaries: Overlies fossiliferous marine sandstones of Permian age, underlies Lower Cretaceous Malha Formation.

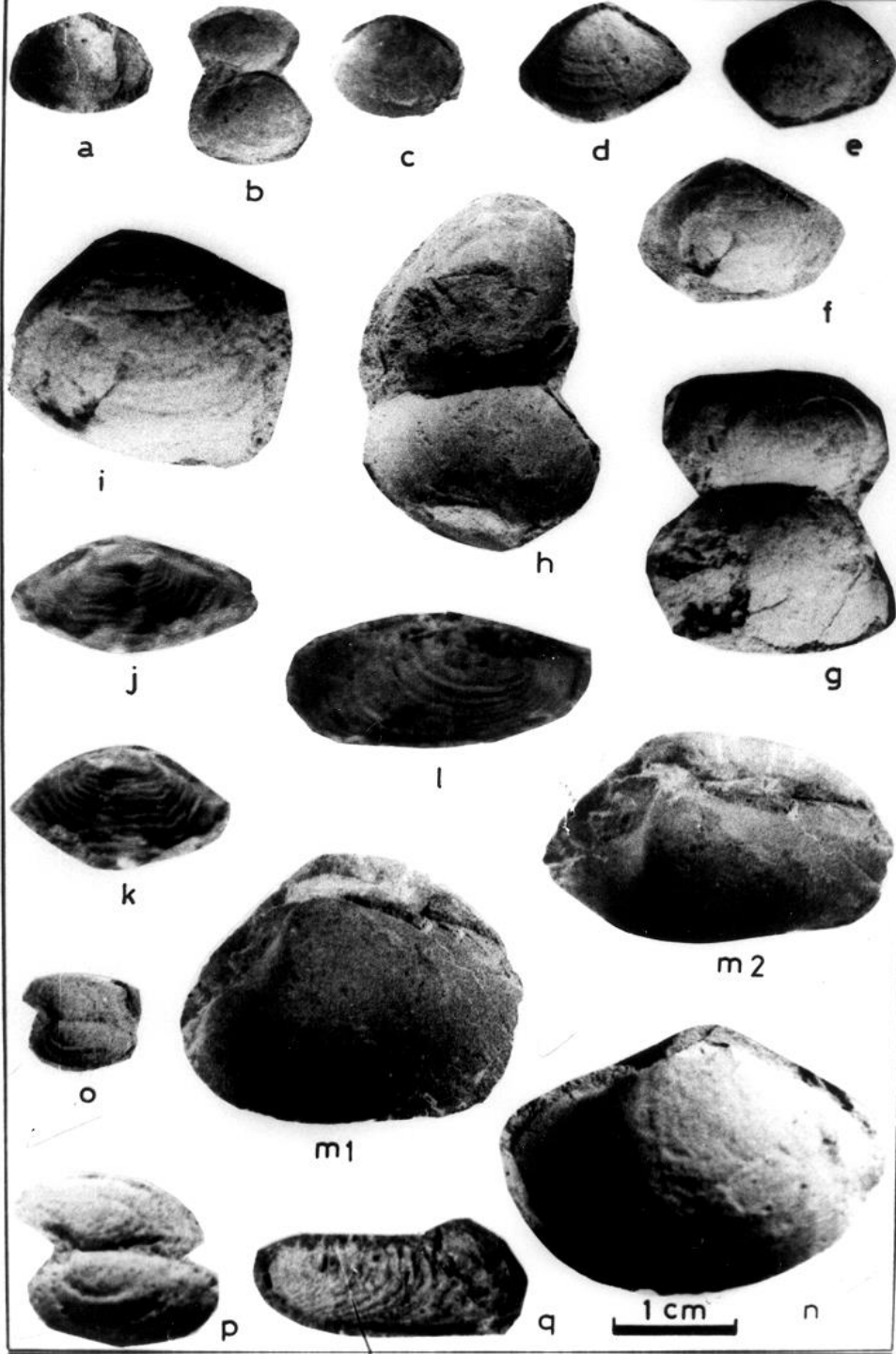
Extent: Wide areal distribution in the Gulf of Suez region. It is also exposed in the cliffs of Gabal El-Tih between Wadi El-Hommur and Gabal El-Ragaba, and in Wadi Budra in Sinai.



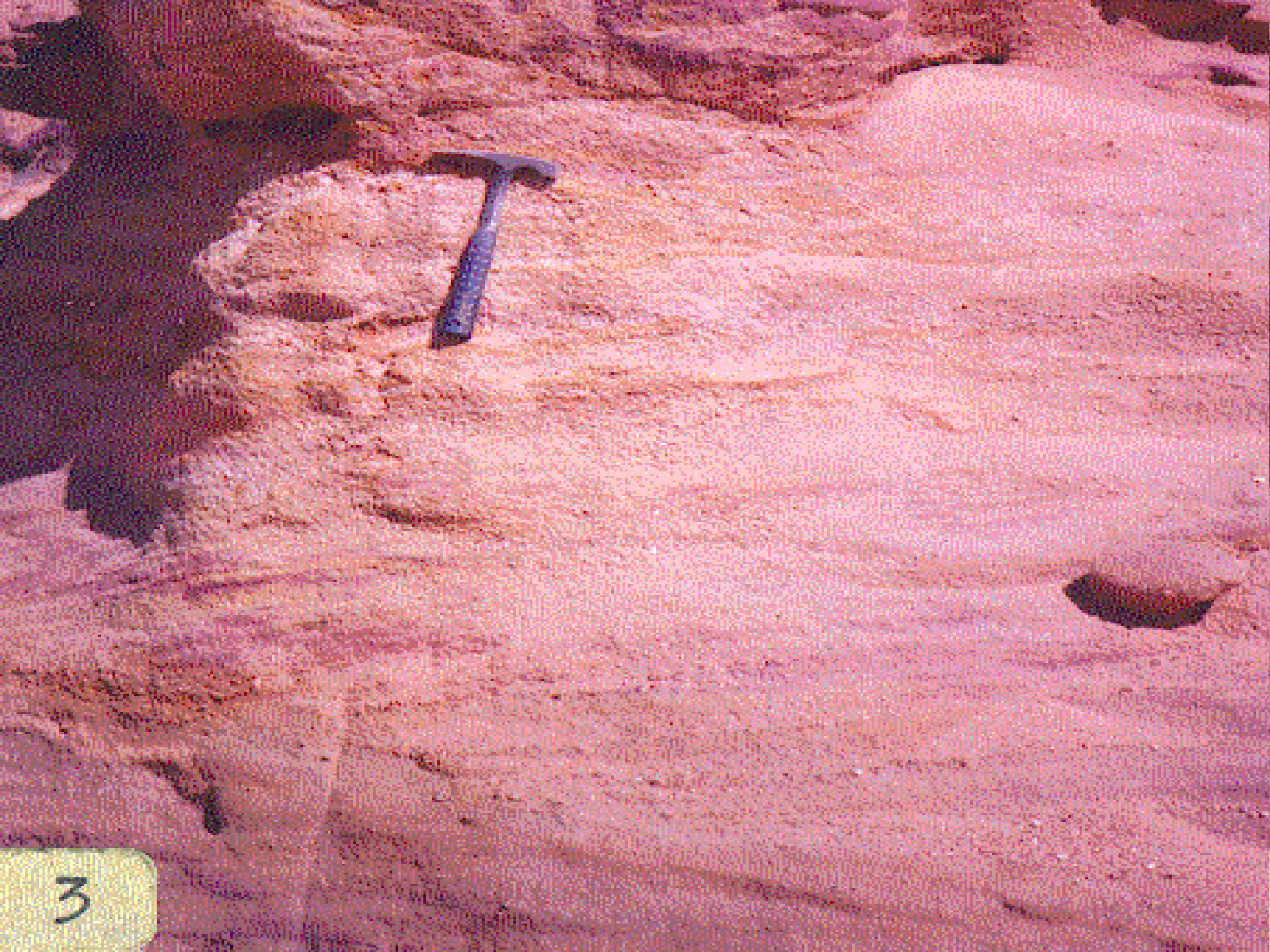
Equivalent units: Budra Formation in Sinai of DRUCKMAN *et al.* (1970); Nubia "A" lower part in the Gulf of Suez wells.

Fossil content and age: Bivalves and gastropods, badly preserved and few plant remains. Permian-Triassic age by its authors, Late Permian age by KORA & MANSOUR (1992), Triassic age by DRUCKMAN *et al.* (1970).

References: ABDALLAH *et al.* (1965) and KORA & MANSOUR (1992).







3



33° 10'

33° 20'

33° 30' E

W. El Hommur

G. Musaba Salama

Debbet El Qerai

G. Um Rinna

Ramlet Himeiyir

W. Khaboba

G. Nakhul

El Qor

W. Abu Thora

W. Sowiq

W. Nuithul

W. Baba

29° 05' N

29° 05' N

29° 00'

29° 00'

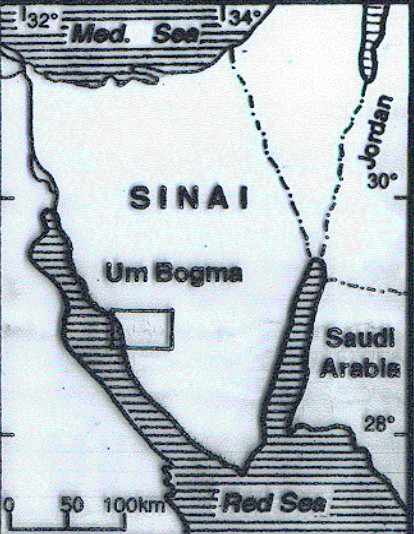
Gulf of Suez

G. Samra

Um Bogma

G. F. El Azraq

G. Serabit El Khadim



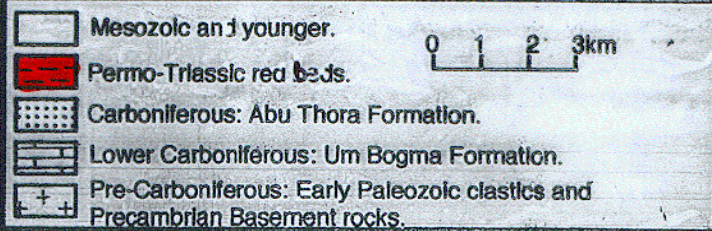
W. Baba

W. Sheilar

G. Adedia

28° 55'

28° 55'



33° 10'

33° 20'

33° 30' E

W. Budra

Wadi Budra; Permo-Triassic red beds

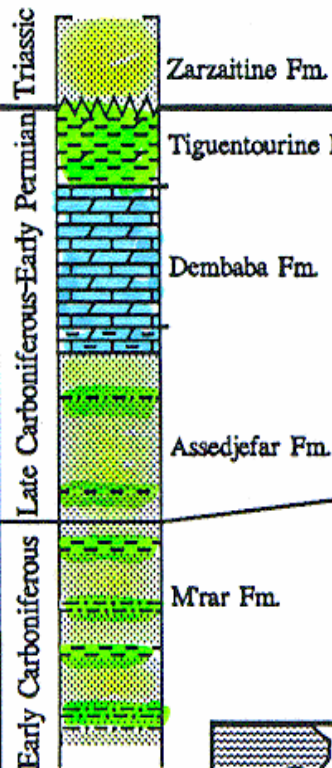






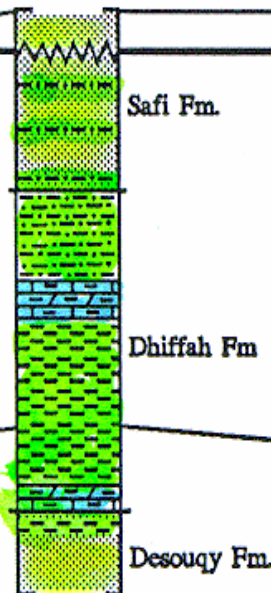
5. Composite Western Libya

(Bellini & Massa 1980)



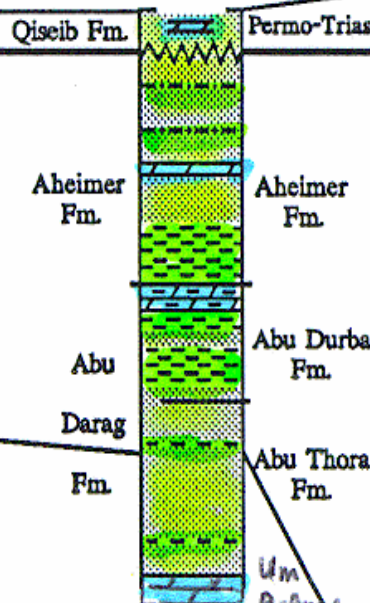
4. Western Egypt

(Keeley 1989)



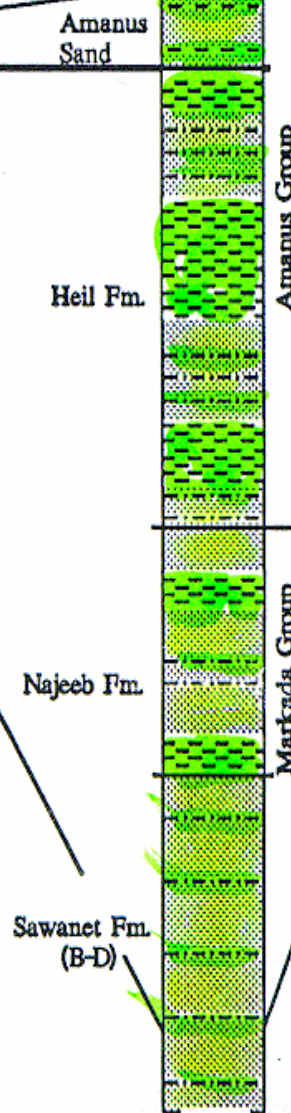
3. Gulf of Suez region

(Present work)



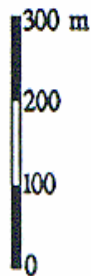
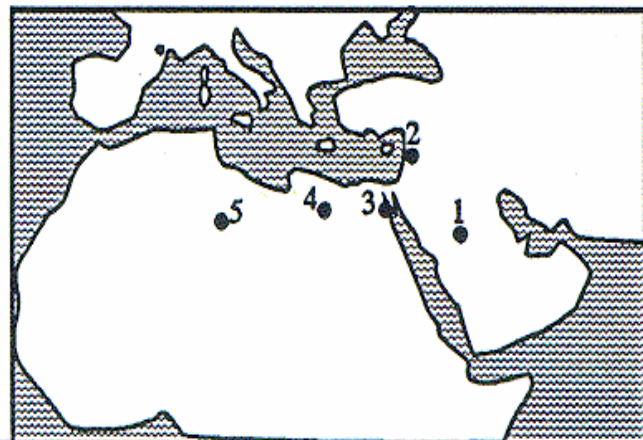
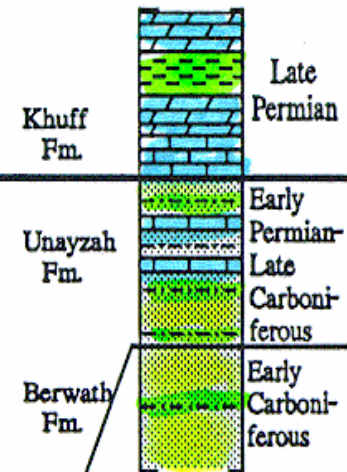
2. Composite Syria

(Al-Youssef & Ayed 1992)



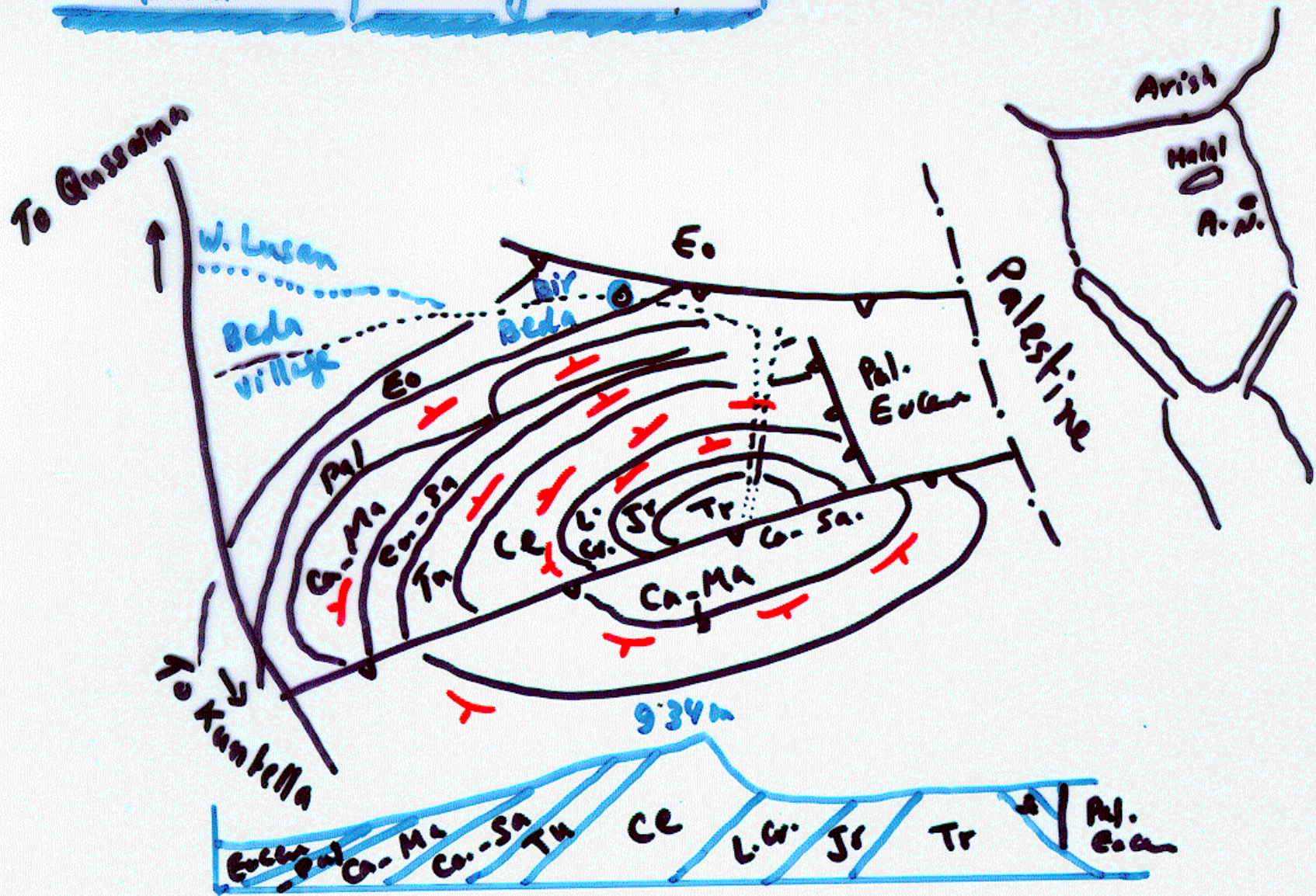
1. Central Saudi Arabia

(Al-Laboun 1982, 1987; McGillivray & Husseini 1992)















2. The Triassic exposures in Gabal Araif El-Naga area



34° 36' E



Geological map of a part of Sinai, after GSE (1993).

-  Quaternary
-  Eocene
-  Palaeocene
-  Maastrichtian-Campanian
-  Santonian-Ceniacian
-  Turonian
-  Cenomanian
-  Albian-Aptian
-  Liassic
-  Abu Nusrah Formation
-  Arif El-Naga Formation

Comment on the map area concerning the rock-stratigraphic sequence, lithology of the rocks, dominant structures and geologic history.



34° 30' E

M. Kora

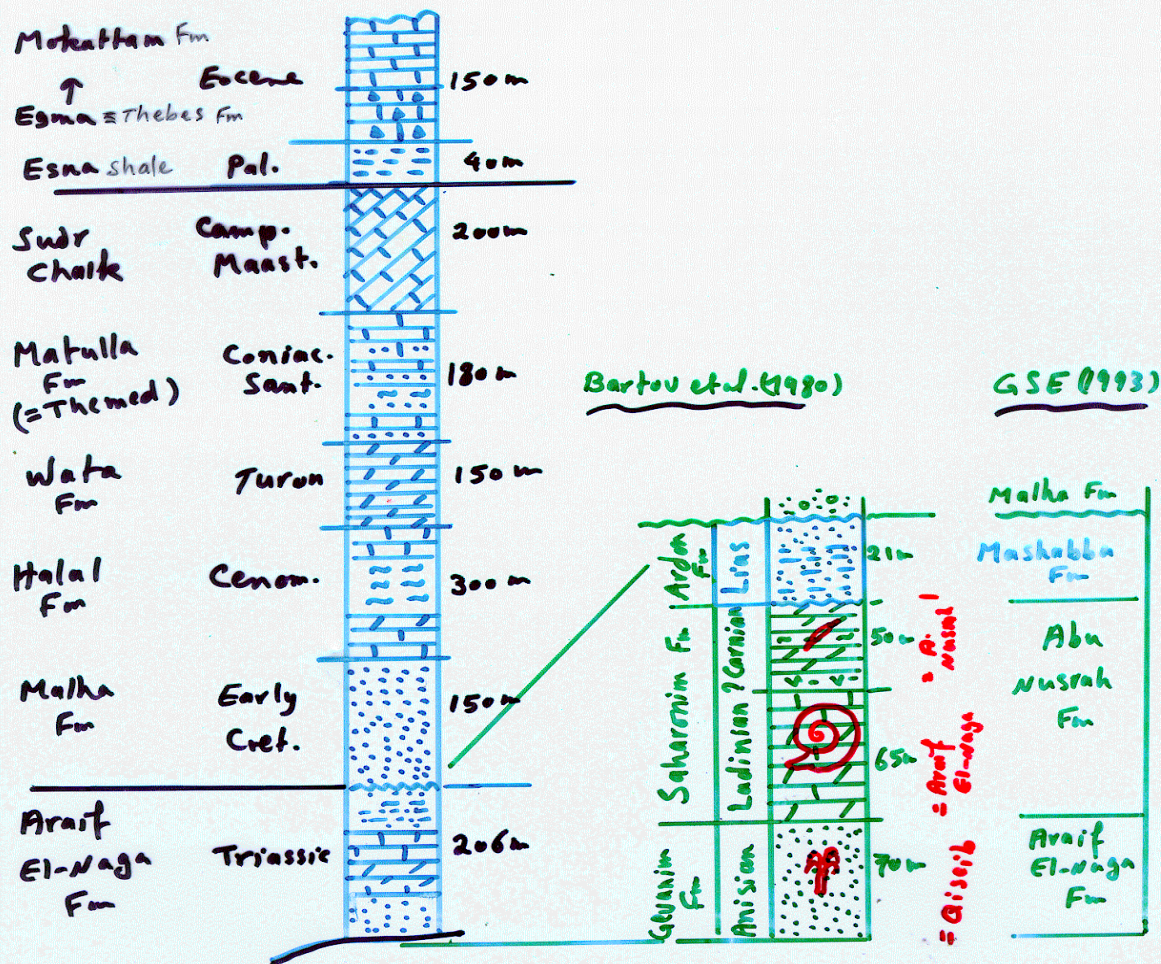
2) The Triassic exposures in northern Sinai

- These are exposed in northern Sinai at the core of Gabal Araif El-Naga, between Wadi Abu Nusrah and Wadi El-Hadhira.
- This Gabal (7 x 4 km) is one of the highest structures in Sinai; maximum relief is 934 m a.s.l., simulating a grazing camel in appearance, along one of the more prominent **Syrian Arcs**.
- The stratigraphic column of the Gabal ranges from Middle Triassic to the Tertiary.
- It is an asymmetrical anticline trending E-NE/W-SW with a fault of the same trend traversing the southern flank of the structure.
- Marine **Middle Triassic** beds (Muschelkalk) from this exposure were first described by **AWAD (1946)**.
- Later, **BARTOV et al. (1980)**, **ALLAM & KHALIL (1988)** and **ABED et al. (1992)** worked on different aspects of the sediments.

Gabal Araf El-Naga:

- * NE Sinai, 40 Km. south of Qusselma "mane of the Camel"
- * NE/SW trending anticlinal structure "Syrian Arc"
- * 7 x 4 km (Triassic exposures are 0.3 Km² only)
- * Maximum relief 934 m a.s.l., represented by Cenomanian
- * Triassic Core is exposed between W. Abu Nusrak and Wadi El. Hadhira
- * Studied by Awad (1946), Bartov et al. (1980) Abed et al. (1996), GSE (1993), etc.
- * Better developed in Wadi Ruman, Palestine.
- * subsurface records in Sinai; Netehl, Abu Hamal, Hamra and Ayoun Mousa wells.

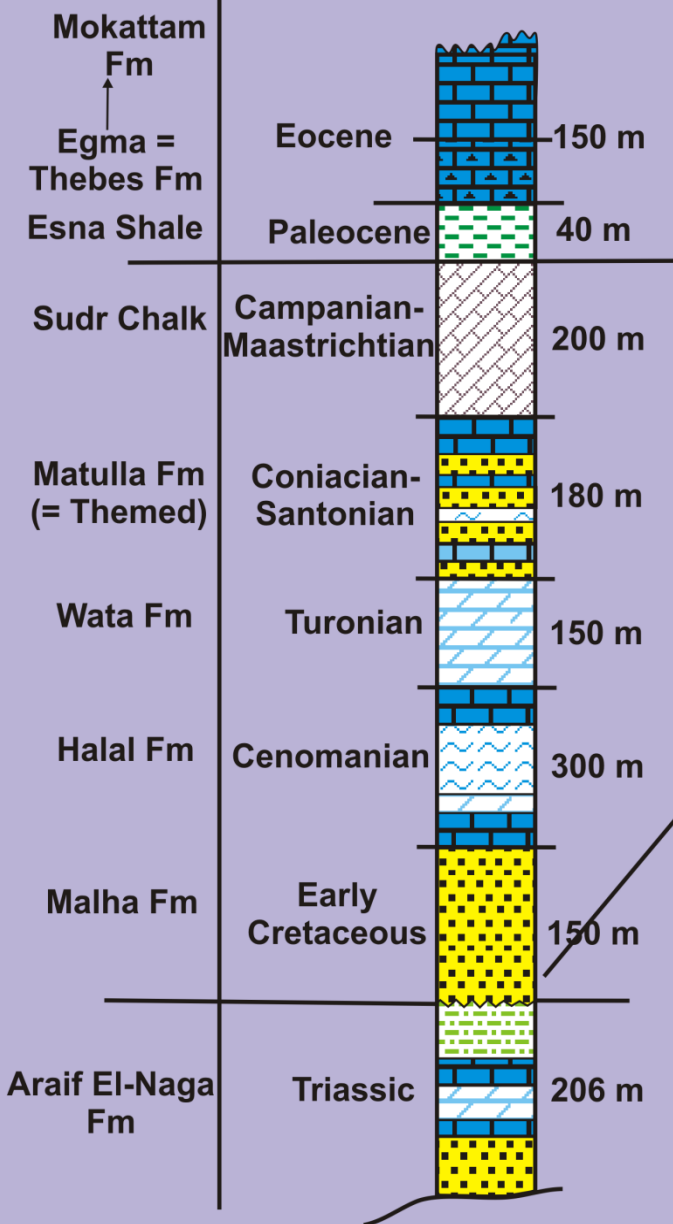
The Stratigraphic Succession of G. Araif El-Naga (Said 1971):



Middle Triassic
guide fossils
(Muschelkalk)

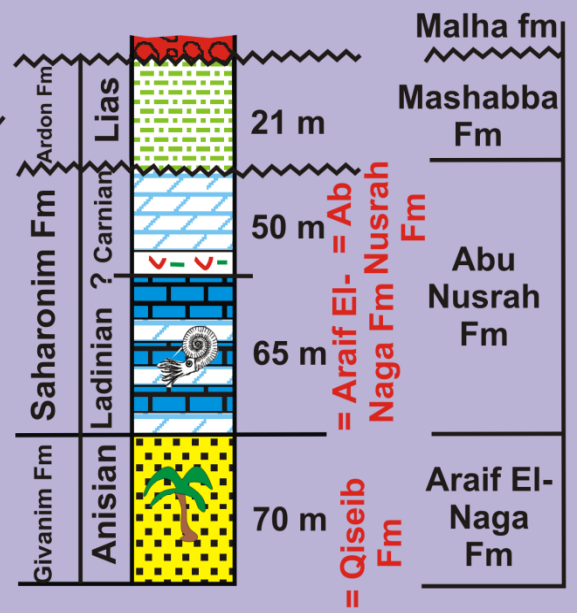
Paraceratites binodosus
Germano nautilus bidorsatus
Gevanites awadi
Coenothyrus vulgaris (Terebratulina), *Myophoria conica*, etc

The stratigraphic succession of Gabal Araif El-Naga (Said1971)



Bartov et al. (1980)

GSE (1993)



Recently, the Geological Survey of Egypt (1993) subdivided the Araif El-Naga succession into three formations from top to bottom as follows:

- **iii) Mashabba Formation** (21 m, Early Liassic):
Ferruginous silt shales alternating with variegated cross bedded sandstones and dolostones with basal pisolitic shale (the so called flint clay). It corresponds to the Ardon Formation of BARTOV *et al.* (1980).
- **ii) Abu Nusrah Formation** (115 m, Ladinian-? Early Carnian):
Fossiliferous hard limestones (dolomitized) marls, shales with a few beds of dolomite and gypseous clays. It corresponds to the Saharonim Formation of the Israeli geologists and was deposited in a shallow marine environment with local hyper saline conditions developing on top of the succession. It is richly fossiliferous by the ammonites *Paraceratites binodosus*, *Gevanites awadi*, *Beneckia levantina* and *Germanonautilus sp.*, etc. together with common brachiopods as *Coenothyris vulgaris* and bivalves like *Myophoria coxi*.
- **i) Araif El-Naga Formation** (70 m, Anisian):
Dark coloured fluvial-fluviomarine quartzitic sandstone and clay beds with some plant imprints and fossil wood, corresponding to the Gevanim Formation of the Israelis.

**Triassic exposures at the core of Gabal
Araif El Naga structure**



