



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %



شبكة المعلومات الجامعية



بعض الوثائق الأصلية تالفة



شبكة المعلومات الجامعية



بالرسالة صفحات

لم ترد بالأصل

B1.1.4

**GEOLOGY AND GEOCHEMISTRY OF THE
BASEMENT ROCKS IN GABAL RIBDAB –
GABAL SHASHOBA AREA, SOUTH
EASTERN DESERT, EGYPT**



**A THESIS SUBMITTED
FOR THE Ph. D. DEGREE
IN GEOLOGY**

**BY
NAGY YOWAKIM BENIAMIN
(M. SC. IN GEOLOGY)**

**GEOLOGY DEPARTMENT
FACULTY OF SCIENCE
ZAGAZIG UNIVERSITY
BANHA BRANCH**

2002

**TO MY PARENTS, WIFE,
DAUGHTER AND SON**

CONTENTS

ACKNOWLEDGEMENT

Page

CHAPTER (I): INTRODUCTION

I. 1. Location and delimitation of the area.....	1
I. 2. Geomorphologic features.....	1
I. 3. Accessibility.....	4
I. 4. Aim of the present work.....	5
I. 5. Methods of the study.....	5
A. Fieldwork.....	5
B. Petrography and opaque mineralogy.....	6
C. Geochemical analysis.....	6
D. Structural analysis.....	6
I. 6. Notes on the classification of Precambrian rocks and tectonic evolution in the Eastern Desert.....	7
I. 7. Previous work.....	11

CHAPTER (II): GEOLOGIC SETTING

II. 1. Gneisses	16
II. 2. Dismembered Ophiolites.....	18
A. Ultramafic rocks	18
B. Metagabbros.....	21
C. Deformed pillow lavas.....	21
II. 3. Arc volcanic assemblages.....	21
A. Mafic to intermediate metavolcanics.....	24
B. Intermediate to felsic metavolcanics.....	27
C. Metatuffs.....	27
II. 4. Syn – tectonic gabbros	27

II. 5. Syn – tectonic granitoids.....	31
II. 6. Less metamorphosed subvolcanics.....	33
II. 7. Late – tectonic granitoids.....	37
II. 8. Post – tectonic granitoids.....	40
II. 9. Dykes and Veins.....	40

CHAPTER (III): PETROGRAPHY AND OPAQUE MINERALOGY

Petrography.....	46
III. 1. Gneisses.....	46
A. Biotite Gneiss.....	46
B. Tonalite gneiss.....	51
C. Amphibolites.....	52
III. 2. Dismembered Ophiolites.....	54
A. Ultramafic rocks	54
B. Metagabbros.....	61
C. Deformed pillow lavas.....	63
III. 3. Arc volcanic assemblages.....	63
A. Mafic to intermediate metavolcanics.....	64
B. Intermediate to felsic metavolcanics.....	68
C. Metatuffs.....	72
a. Intermediate metatuffs.....	72
b. felsic metatuffs.....	73
III. 4. Syn – tectonic metagabbros.....	74
III. 5. Syn – tectonic granitoids.....	76
III. 6. Dokhan volcanics.....	80
III. 7. Late – tectonic granitoids	80
III. 8. Post – tectonic granitoids.....	85

Opaque Mineralogy.....	89
III. 9. Opaque minerals in the ultramafic rocks.....	89
III. 10. Opaque minerals in the ophiolitic metagabbros.....	90
III. 11. Opaque minerals in the syn- tectonic metagabbros.....	93
III. 12. Opaque minerals in the mineralized quartz veins.....	96

CHAPTER (IV): GEOCHEMISTRY

IV. 1. Geochemistry of the gneisses.....	98
IV. 2. Geochemistry of the metavolcanic rocks.....	107
IV. 3. Geochemistry of less metamorphosed subvolcanics.....	127
IV. 4. Geochemistry of the granitoid rocks.....	136

CHAPTER (V): STRUCTURAL ANALYSIS AND TECTONIC EVOLUTION

V. 1. Structural analysis.....	159
A. Folds.....	159
B. Foliations.....	165
C. Lineations.....	165
D. Geometrical analysis.....	167
E. Faults.....	172
V. 2. Tectonic evolution.....	175

CHAPTER (VI): SUMMARY AND CONCLUSIONS

REFERENCES

ARABIC SUMMARY

ACKNOWLEDGEMENT

The author express his thanks to Dr. M. A. El Amawy and Dr. M. M. Wetaït, who are Assoc. Professors in Geology Department, Faculty of Science, Zagazig University, Banha Branch for their guidance in the field, fruitful discussions, continuous help during the progress of work and their critical reading and editing of the manuscript.

The author is grateful to Mr. B. B. Nasr, General Director of Regional Geology, Egyptian Geological Survey and Mining Authority for providing the facilities, guidance in the field, valuable discussions and suggestions.

The author expresses his thanks to the chairman and staff members of the Geology Department, Faculty of Science, Zagazig University, Banha Branch for the many facilities provided during the progress of work.

Thanks are also due to the chairman of the Geological Survey and Mining Authority and my colleagues at the Geological Survey and Mining Authority who gave me many facilities during the field work and geochemical analyses.

Thanks are also rendered to the Scientific Research Academy and Technology for its support to achieve this work.

CHAPTER ONE

INTRODUCTION

CHAPTER (I)

INTRODUCTION

I. 1. Location and delimitation of the area

Gabal Ribdab – Gabal Shashoba area is located in the southern sector of the Precambrian rocks of Eastern Desert of Egypt, about 250 km southeast of Aswan via Aswan – Allaqi asphaltic road. It is named after the conspicuous mountain range of Gabal Ribdab (700 m) and Gabal Shashoba (500 m), occupying the northwestern and southeastern parts of the study area respectively. The investigated area lies in Elba topographic sheet (No. 12), scale 1: 500,000.

The study area occupies an area of about 800 km² and is bounded by the Latitudes 22° 30' - 22° 45' N and Longitudes 33° 55' - 34° 15' E (Figs. 1, 2).

I. 2. Geomorphologic features

The area under consideration is characterised by moderate to high relief mountain. It is drained by a number of wadis and tributaries. The following are the main wadis that traverse the present area:

- 1- Wadi Um Ghalga traverses the western part of the area at Gabal Ribdab and Gabal Dheis. Its course trends nearly NNE – SSW, then branches northwards to the east and west.
- 2- Wadi Abu Had lies in the central part of the study area at the eastern part of Gabal Um Krush. It trends NNE – SSW and its course represents the trace of strike slip fault.
- 3- Wadi Siga extends north of Gabal Shashoba and follows N – S trend. Northward, it swings to the east and attain the NNE – SSW trend.

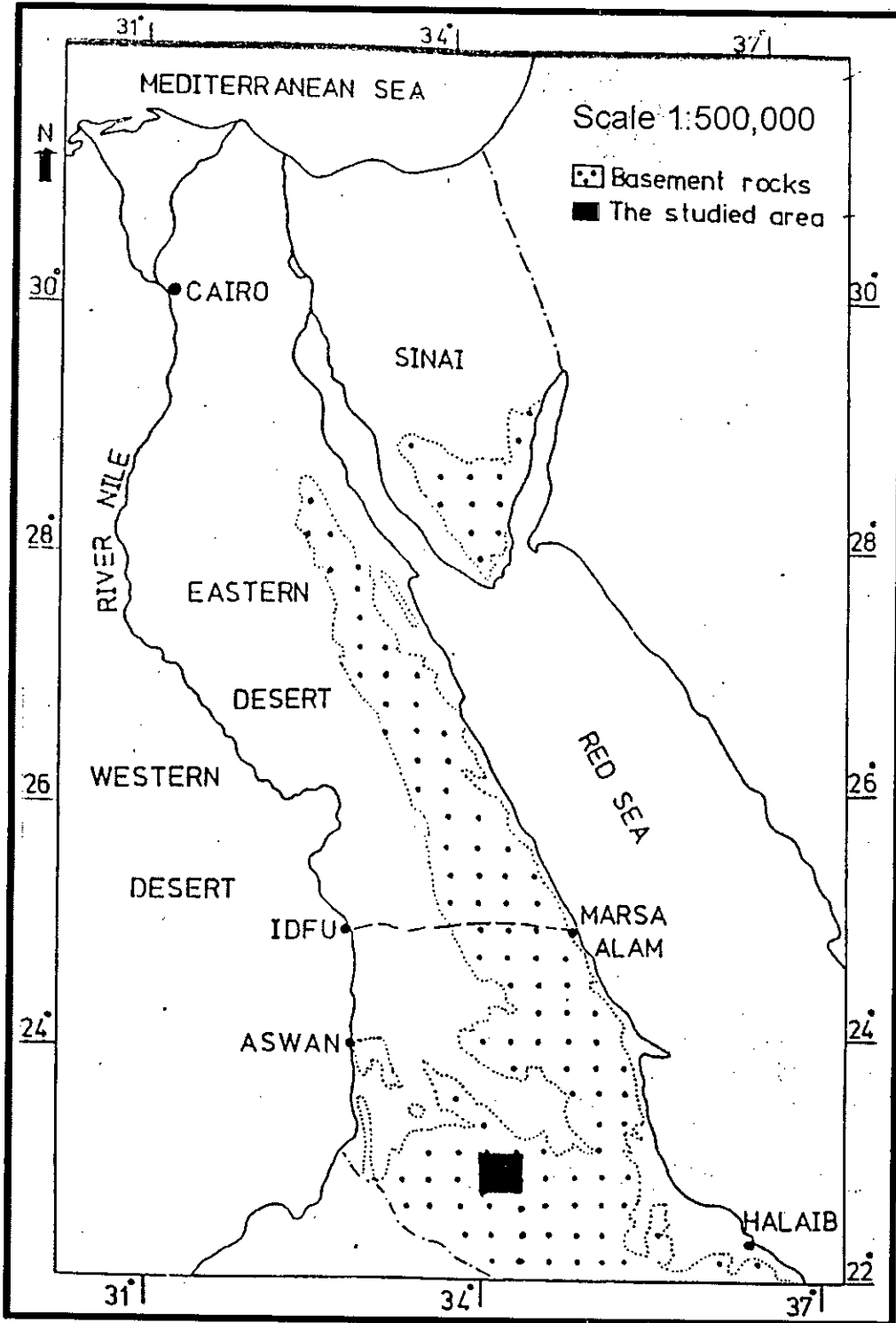
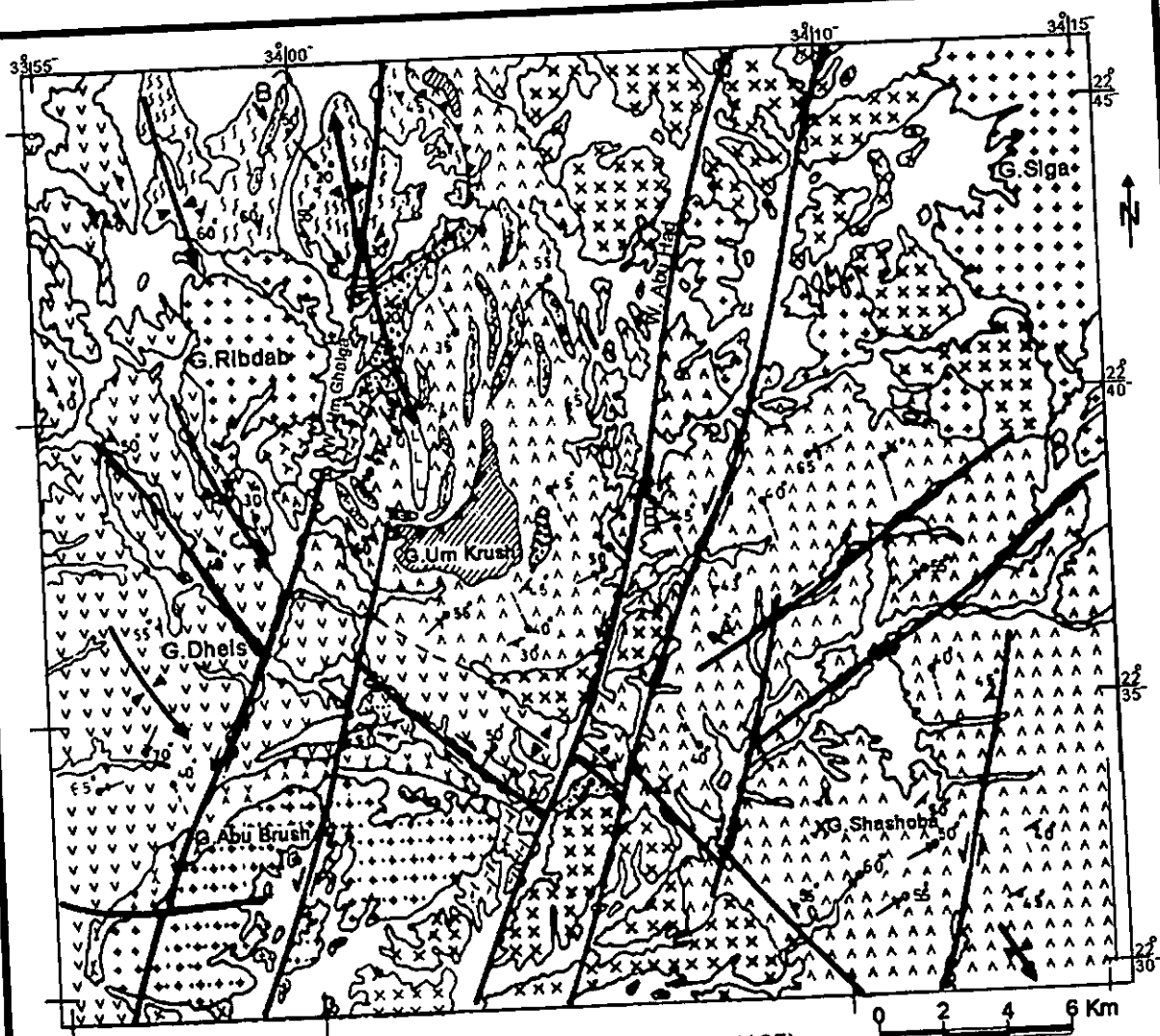


Fig. (1) Location map of study area



A - A' and B - B' are cross sections shown in Fig. (165)

LEGEND

- Dykes and veins
- Post-tectonic granitoids
- Late-tectonic granitoids
- Dokhan volcanics
- Syn-tectonic granitoids
- Syn-tectonic gabbros

- Intermediate to acid metavolcanics and metatuffs
- Basic to intermediate metavolcanics
- Deformed pillow lavas
- Metagabbros
- Highly Sheared ultramafic rocks
- Ultramafic rocks
- Gneisses

Ophiolites

SYMBOLS

- F2 major faults
- F1 minor faults
- F2 minor faults
- F3 minor faults
- Thrust faults
- Strike slip faults
- Strike and dip of foliation
- Major shear zone
- Gold mine

Fig. (2) Geologic map of Gabal Ribdab - Gabal Shashoba area.