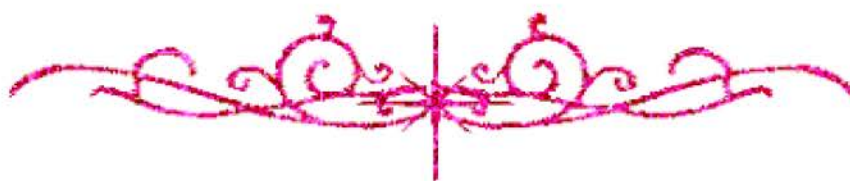


سامية محمد مصطفى



شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



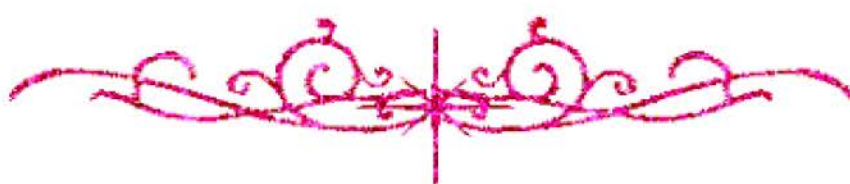
سامية محمد مصطفى



شبكة المعلومات الجامعية



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



سامية محمد مصطفى



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

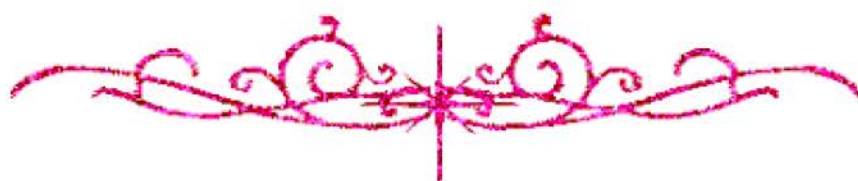
قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



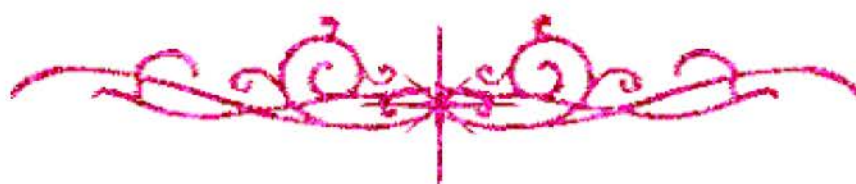
سامية محمد مصطفى



شبكة المعلومات الجامعية



بعض الوثائق الأصلية تالفة



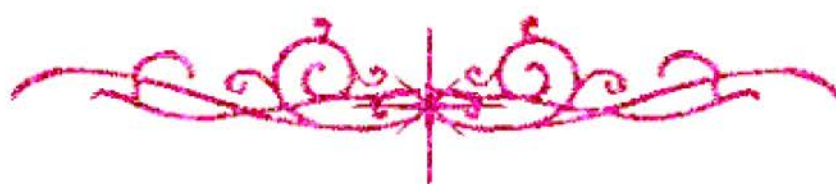
سامية محمد مصطفى



شبكة المعلومات الجامعية



بالرسالة صفحات لم ترد بالأصل





Zagazig University
Benha Branch
Faculty of Science
Zoology Department

DEVELOPMENTAL STUDIES ON THE SKULL OF THE TELEOST FISH "*CTENOPHARYNGODON IDELLA*"

A Thesis

Submitted in Partial Fulfillment of the Requirement for the
Degree of Master of Science in Zoology

Presented by

NEVINE MOHAMMED ANWER MAHMOUD HUSSIEN
(B. Sc. Zoology)

Supervised by

PROF. DR. GAMAL A. MADKOUR

Professor of Comparative
Anatomy and Embryology,
Faculty of Science
Tanta University

PROF. DR. SABRY S. EL-SERAFY

Professor of Fish Biology and
Dean of Faculty of Science
Zagazig University
Benha Branch

DR. RAGAA M. EL-BALSHY

Assistant Professor of Comparative
Anatomy and Embryology,
Faculty of Science
Zagazig University, Benha Branch

*Faculty of Science
Zagazig University
Benha Branch*

B

1C-V7



وقل رب زدني علماً

صدق الله العظيم

DEDICATION

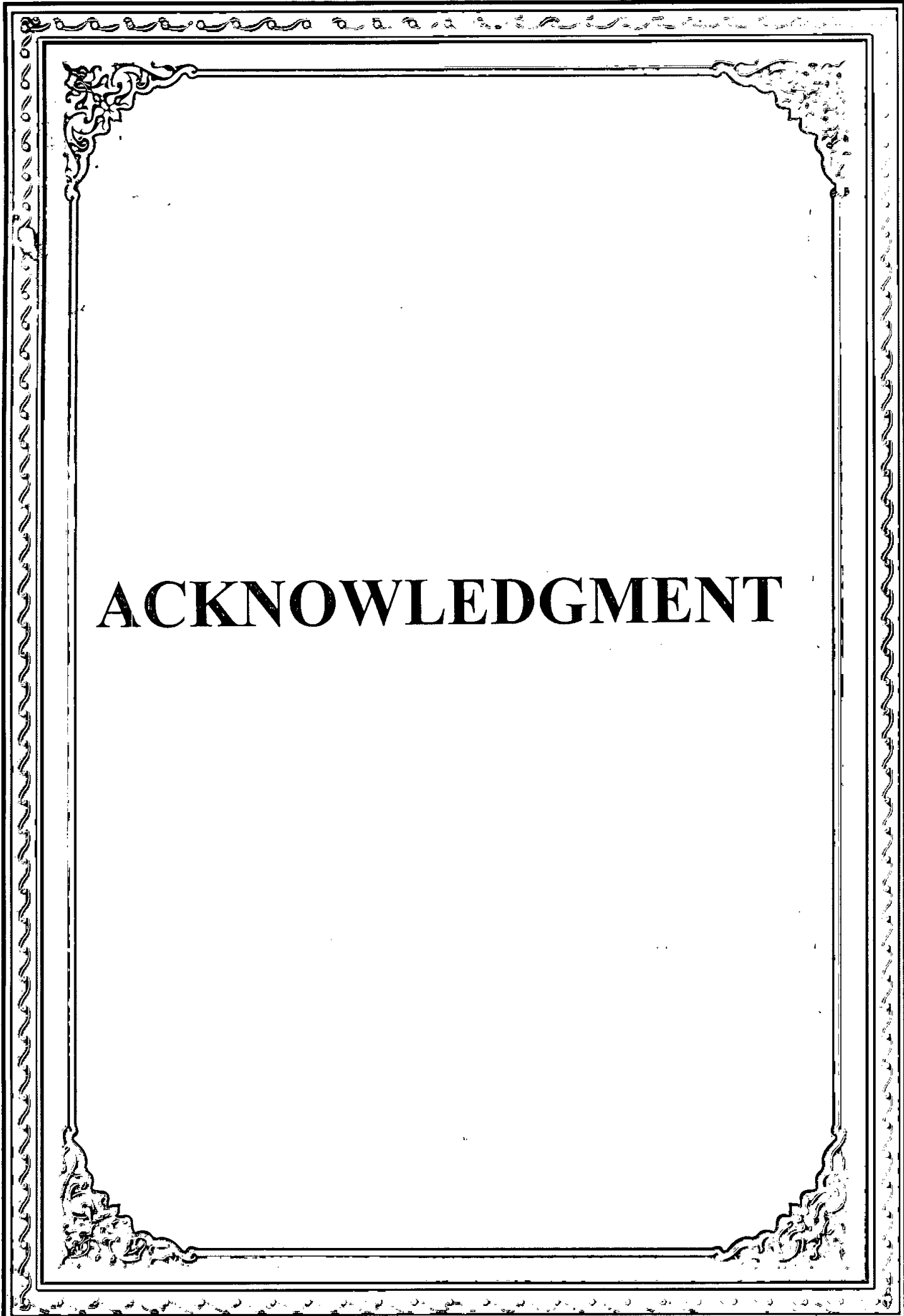
*To my parents, my brother, my husband
and my daughters;
(MENNAT ALLAH and HEBAT ALLAH)*

CONTENTS

	Page
1. ACKNOWLEDGMENT	
2. INTRODUCTION AND HISTORICAL REVIEW	1
3. MATERIAL AND METHODS	15
A. Source of material used in the present study	15
B. Preparation of serial sections	15
C. Drawings	16
4. RESULTS	17
- Stage I (4 mm larva)	17
I- The neurocranium	17
- Stage II (5 mm larva)	19
I. The neurocranium	19
II. The splanchnocranium	21
1. The mandibular arch	21
2. The hyoid arch	22
3. The branchial arches	22
- Stage III (6 mm larva)	23
I. The neurocranium	23
II. The splanchnocranium	25
1. The mandibular arch	25
2. The hyoid arch	26
3. The branchial arches	27
- Stage IV (7mm larva).....	27
I. The neurocranium	27
II. The splanchnocranium	30

	Page
1. The mandibular arch	30
2. The hyoid arch	30
3. The branchial arches	32
- Stage V (8 mm larva)	33
I. The neurocranium	33
II. The splanchnocranium	36
1. The mandibular arch	36
2. The hyoid arch	37
3. The branchial arches	38
- Stage I (10 mm larva)	39
I. The neurocranium	39
II. The splanchnocranium	42
1. The mandibular arch	42
2. The hyoid arch	42
3. The branchial arches	43
5. DISCUSSION	46
I. The neurocranium	46
II. The splanchnocranium	55
1. The mandibular arch	55
2. The hyoid arch	58
3. The branchial arches	62
6. ENGLISH SUMMARY	68
7. REFERENCES	72
8. LIST OF ABBREVIATIONS	80
9. EXPLANATION OF FIGURES AND PLATES	83
10. GRAPHICAL RECONSTRUCTIONS	88
- Stage 4 mm total length Figures 1-2	88-89
- Stage 5 mm total length Figures 3-7	90-94
Pl. 1	95

		Page
- Stage 6 mm total length	Figures 8-12	96-100
	Pl. 2	101
- Stage 7 mm total length	Figures 13-17	102-106
	Pl. 3 & 4	107-108
- Stage 8 mm total length	Figures 18-22	109-113
	Pl. 5	114
- Stage 10 mm total length	Figures 23-27	115-119
	Pl. 6	120
11. ARABIC SUMMARY		



ACKNOWLEDGMENT

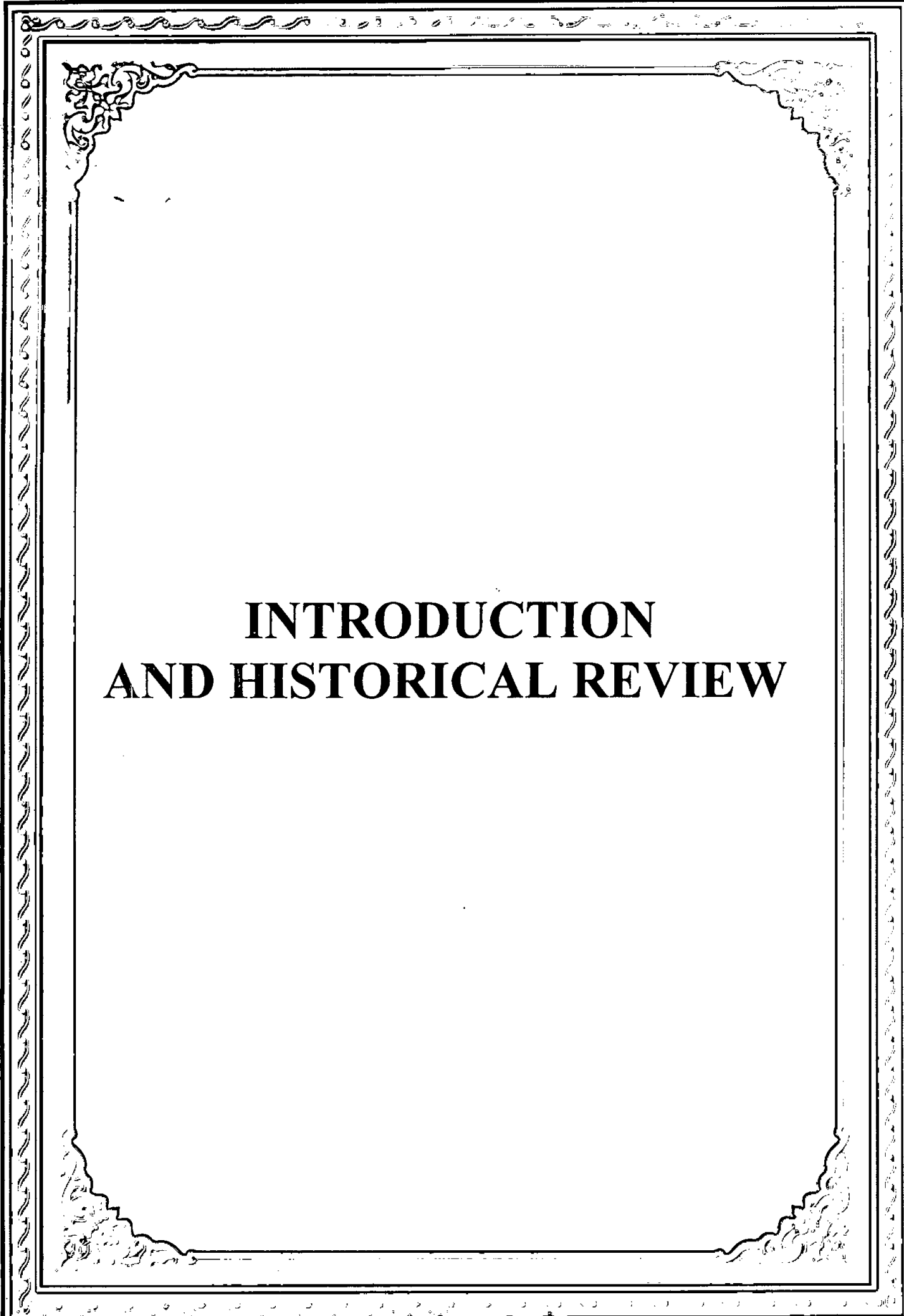
ACKNOWLEDGMENT

The author wishes to express her sincere gratitude and appreciation to *Professor DR. GAMAL ABDEL RAOUF MADKOUR*, Professor of Zoology, Faculty of Science, Tanta University, for his supervision and providing the necessary facilities needed for this work. His unlimited help, his encouragements, and his critical reviewing of the manuscript are greatly acknowledged and deeply appreciated.

The author wishes also to express her deep gratefulness to *DR. RAGAA MUSTAFA EL-BALSHY*, Assistant Professor of Zoology, Faculty of Science, Zagazig University, Benha Branch, for suggesting this point of research, critical reading of the manuscript and offering valuable comments and suggestions needed for the work.

Particular gratitude is due to *Professor DR. SABRY SADEK EL-SERAFY*, Professor of Zoology, Faculty of Science, Zagazig University, Benha Branch, for his continuous encouragement, his unlimited help and his valuable guidance.

Finally, I wish to express my cordial thanks to my mother for her patience and encouragement during the period of the whole work.



INTRODUCTION AND HISTORICAL REVIEW

INTRODUCTION AND HISTORICAL REVIEW

The study of the development of the skull in bony fishes is bound up with the recognition of two materials: cartilage and bone, of which the skull is mainly composed, and with the theories concerning the relations of these tissues to one another both anatomically and developmentally.

The chondrocranium is composed primarily of a trough of cartilage, the cavity of which is occupied by the brain, and is more or less open at its dorsal surface. There are three pairs of centers of chondrification which transform into cartilaginous material, from posterior to anterior are:

- a. A pair of parachordal cartilages, that laying on either side of the notochord.
- b. A pair of polar cartilages: which are small rounded centers above the notochord.
- c. A pair of trabeculae cranii, that are elongated centers in front of the polar cartilages.

The floor of the cranium begins by an accumulation of mesenchium cells which are derived from the mesoderm in the neighbourhood of the notochord, both on either side of it and anterior to its level. Somewhat about the middle of the floor of the chondrocranium there is a recess in which the infundibulum rests. The part of the floor of the chondrocranium behind this recess is characterized by having the anterior part of the notochord embedded in it. Thus the distinction is made
