



**PHYLOGENETIC ANALYSIS AND BARCODING OF GOBY SPECIES IN
MARAGONDON RIVER, CAVITE USING CO1 GENE**

An Undergraduate Research Presented to the
Faculty of the Biological Sciences Department
College of Science
De La Salle University - Dasmariñas
Dasmariñas, Cavite

In Partial Fulfilment of the Requirements
for the Degree of Bachelor of Science Major in Human Biology

Dawn Mitzerl V. Panoncillo

Alyssa Marie I. Rogado

March 2014



ABSTRACT

Gobiidae is one of the largest families of acanthomorph fishes found in the Philippines. Despite this, much has to be discovered and determined, especially in Margondon River, at the foot of Mts. Palay-Palay National Park, a protected landscape. Morphometrics and morphological characteristics were examined for initial identification. Pre-extracted DNAs were amplified using primers for cytochrome c oxidase subunit 1 (CO1); the sequences were analyzed to estimate divergence and determined phylogenetic relationship of the samples. Cytochrome c oxidase subunit 1 (CO1) ranged from 676 to 692 bp. B9 and B10 was identified as *Glossogobius aureus*, while B4, B5 B6, B8 and B11 putatively belongs to *Glossogobius* spp. All the query sequences formed a paraphyletic family of Gobiidae, although not well supported, as well as polyphyly of subfamilies *Gobiinae* and *Gobionellinae*.



TABLE OF CONTENTS

Title Page	1
Abstract	2
Approval sheet	3
Acknowledgments	4
Table of Contents	6
CHAPTER 1 INTRODUCTION	
1.1 Background of the Study	11
1.2 Conceptual Framework	12
1.3 Statement of the Problem	13
1.4 Scope and Limitations	13
1.5 Significance of the Study	14
1.6 Definition of Terms	15
CHAPTER 2 LITERATURE REVIEW	
2.1 Conceptual Literature	16
2.2 Related Studies	21
CHAPTER 3 METHODOLOGY	
3.1 Research Design	24
3.2 Research Setting	24
3.3 Research Procedure	24
3.4 Data Gathering and Statistical Analysis	28



CHAPTER 4 RESULTS AND DISCUSSION

4.1 Result	29
4. 2. Discussion	35

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5. 1 Conclusions	40
5. 2 Recommendation s	41

Cited References	42
------------------	----

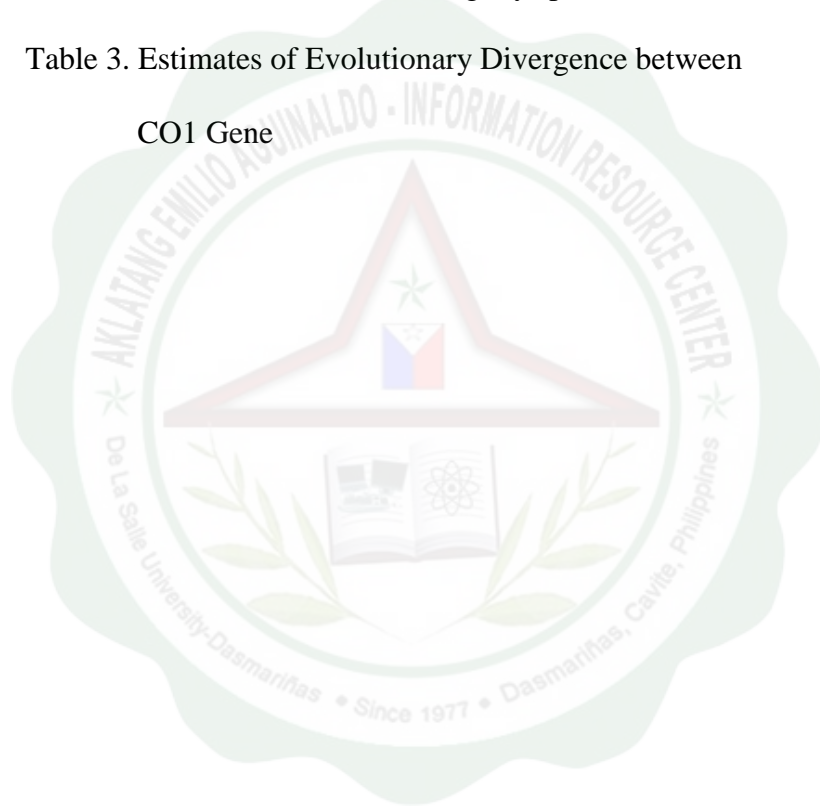
APPENDICES

A. Map of the study	46
B. Morphometric Measurement	47
C. PCR Master mix computation	48
D. Electrophoresis by 1 st base Asia	49
E. Photodocumentation	50
F. Curriculum Vitae	55-56



LIST OF TABLES

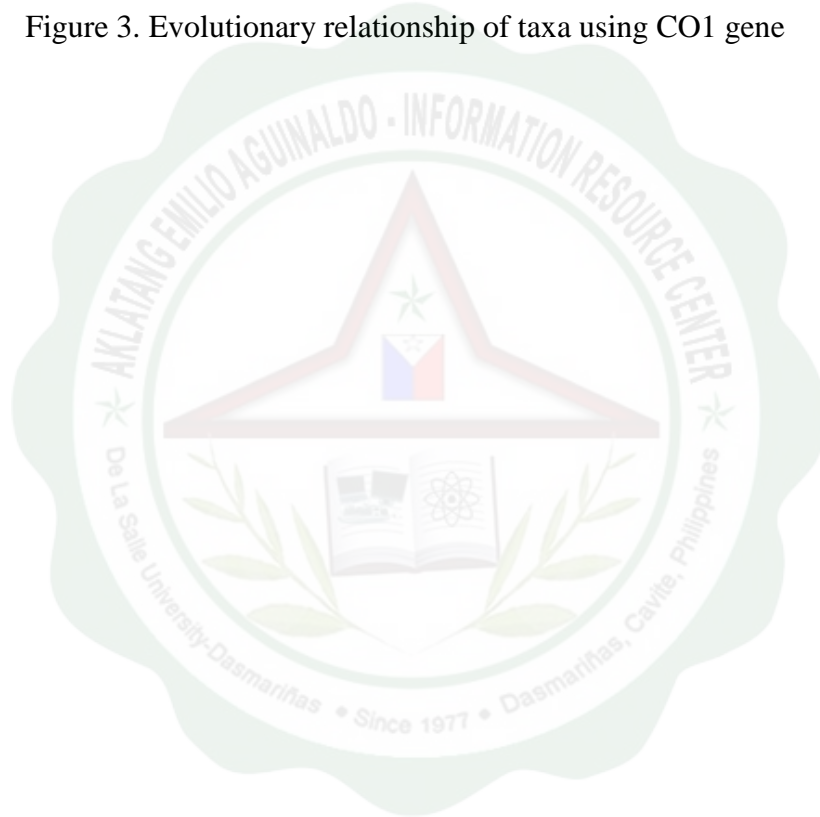
Table 1. Morphometric measurement of the collected goby species	30
Table 2. BLASTN matches of the goby species	31
Table 3. Estimates of Evolutionary Divergence between CO1 Gene	32





LIST OF FIGURES

Figure 1. Conceptual framework	12
Figure 2. Mitochondrial gene (CO1)	19
Figure 3. Evolutionary relationship of taxa using CO1 gene	34





LIST OF PLATES

Plate 1. Morphometric Measurement based on FISHBASE	47
Plate 2. Electrophoresis by 1 st base Asia	49
Plate 3. Fish Collection	50
Plate 4. Analysis of Physiochemical Characteristics of the River	50
Plate 5. Collected Specimens	51
Plate 6. Morphometric Measurement of the collected species	51
Plate 7. Preparation of DNA for PCR mix	52
Plate 8. Preparation of mastermix	52
Plate 9. Samples placed in the PCR machine	53
Plate 10. Preparation for electrophoresis	53
Plate 11. Agarose Gel Electrophoresis	54
Plate 12. Materials used for PCR mix	54