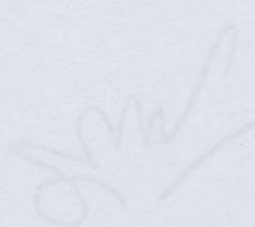



This Final Year Report entitled "Prevalence of ectoparasites of Balitoridae fishes in some upstream rivers at Kundasang" was submitted by Mohd Al Hafiz Bin Sovester and was approved by

**PREVALENCE OF ECTOPARASITES OF BALITORIDAE
FISHES IN SOME UPSTREAM RIVERS AT
KUNDASANG**


Aizat Sawti
Supervisor
B. Sc. (Hons.) Biology
Faculty of Applied Science
Universiti Teknologi MARA

MOHD AL HAFIZ BIN SOVESTER



Aizat Sawti
Project Supervisor
B. Sc. (Hons.) Biology
Faculty of Applied Science
Universiti Teknologi MARA
38997 Kota Kinabalu Sabah

**Final Year Project Report Submitted In
Partial Fulfillment of The Requirement For The
Degree of Bachelor of Science (Hons.) Biology
In The Faculty of Applied Science
Universiti Teknologi MARA**

38997 Kota Kinabalu Sabah

Date: 1-7-2016

JULY 2016

ACKNOWLEDGEMENTS

I would like to express my gratitude firstly to the Almighty God for the endless blessings and knowledge that bestowed upon me until completion of my final year project. Big thanks to my supervisor, Mr. Ansir bin Salim for all the commitment, guidance and all the information that already shared to me. Special thanks to Mr. Ajimi Jawan for giving us, the students taking BIO660 the useful advices and comments. I also would like to thank these amazing friend of mine, Mohd Fikri Sovester helping me to do the sampling collection. To my beloved parents and family, thank you for supporting me in everything I do and always gave me supportive advicè's. Thank you again to all people who helped me directly and indirectly to complete my final year project because without the help from all of this blissful people, I will not be able to complete my final year project.

ACKNOWLEDGEMENT	PAGE
	iii
I would like to express my gratitude firstly to the Almighty God for the endless blessings and knowledge that bestowed upon me until completion of my final year project. Big thanks to my supervisor, Mr. Ansir bin Salim for all the commitment, guidance and all the information that already shared to me. Special thanks to Mr. Ajimi Jawan for giving us, the students taking BIO660 the useful advices and comments. I also would like to thank these amazing friend of mine, Mohd Fikri Sovester helping me to do the sampling collection. To my beloved parents and family, thank you for supporting me in everything I do and always gave me supportive advicè's. Thank you again to all people who helped me directly and indirectly to complete my final year project because without the help from all of this blissful people, I will not be able to complete my final year project.	3
2.0 LITERATURE REVIEW	
2.1 Parasite in fish	4
2.1.1 The Parasite Effect on Fish	4
2.1.2 Importance Study of Fish Parasite	5
2.1.3 Type of Ectoparasitic	6
2.1.4 Environment Factor Effect the Parasite	8
2.1.5 Parasite as Bio Indicator	9
2.1.6 The Environment Factor	10
2.2 Plutiformes Fishes	10
2.2.1 Plutiformes Fishes in Bundo	10
2.3 Fish Catching Method at Rocky Stream	11
2.4.1 Fishing with Bow and arrow	11
2.4.2 Fish Potting	12
2.4.3 Catching By Using the Scoop Net	12
3.0 METHODOLOGY	
3.1 Study Site	14
3.2 Materials	22
3.2.1 Raw materials	22
(Mohd Al Hafiz Bin Sovester)	22
3.2.3 Apparatus	23
3.3 Methods	24
3.3.1 Abiotic parameter measurement	24
3.3.2 Sampling of Fish Mucus	25
3.3.3 Fish species identification	28
3.3.4 Ectoparasites examination	28
3.3.5 Ectoparasites identification	29
3.3.6 Prevalence rate	29

TABLE OF CONTENT

	PAGE
ACKNOWLEDGEMENT	iii
TABLE OF CONTENT	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	x
ABSTRACT	xi
ABSTRAK	xii
1.0 INTRODUCTION	
1.1 Background Study	1
1.2 Problem Statement	3
1.3 Significance of the Study	3
1.4 Objective of the Study	3
2.0 LITERATURE REVIEW	
2.1 Parasite in fish	4
2.1.1 The Parasite Effect on Fish	4
2.1.2 Importance Study of Fish Parasite	5
2.1.3 Type of Ectoparasite	6
2.1.4 Environment Factor Effect the Parasite	8
2.1.5 Parasite as Bio Indicator	9
2.1.6 The Environment Factor	10
2.2 Balitoridae Fishes	10
2.2.1 Balitoridae Fische in Borneo	10
2.3 Fish Catching Method at Rocky Stream	11
2.4.1 Fishing with Bow and arrow	11
2.4.2 Fish Poisoning	12
2.4.3 Catching By Using the Scoop Net	12
3.0 METHODOLOGY	
3.1 Study Site	14
3.2 Materials	22
3.2.1 Raw materials	22
3.2.2 Chemicals	22
3.2.3 Apparatus	22
3.3 Methods	24
3.3.1 Abiotic parameter measurements	24
3.3.2 Sampling of Fish Mocus	25
3.3.3 Fish species identification	28
3.3.4 Ectoparasites examination	28
3.3.5 Ectoparasites identification	29
3.3.6 Prevalence rate	29

3.3.7 Intensity of the parasites	29
4.0 RESULTS AND DISCUSSION	
4.1 Physical Parameter of Water and River Morphology Of Sampling Sites	31
4.2 Ectoparasites on Balitoridae fishes at some upstream rivers at Kundasang	33
4.3 Identification of Ectoparasites groups	34
4.4 Prevalence and intensity of ectoparasites of Balitoridae fishes	40
4.5 Prevalence and intensity of ectoparasites of <i>Protomyzon borneensis</i>	41
4.6 Prevalence and intensity of ectoparasites of <i>Protomyzon griswoldi</i>	43
4.7 Prevalence and intensity of ectoparasites of <i>Gastromyzon borneensis</i>	45
4.8 The prevalence and intensity of ectoparasites on Balitoridae fishes by station and selected rivers	46
4.9 Correlation between water physical parameter with ectoparasites at some upstream rivers at Kundasang.	48
5.0 CONCLUSION AND RECOMMENDATIONS	56
5.1 Conclusion	56
5.2 Recommendation	57
CITED REFERENCES	58
APPENDICES	61
CURRICULUM VITAE	74
3.9 Plastic cooler to save the sample of fish muscle	23
3.10 YSI 556 MPS water multiparameter to measuring the abiotic factor of the study sites	24
3.11 Measuring the abiotic factor by using the YSI 556 MPS water multiparameter	25
3.12 Catching fish randomly by using scoop net	26
3.13 Process of scraping muscle of Balitoridae into slide	27
3.14 Measuring the length of the fish	28

ABSTRACT

PREVALENCE OF ECTOPARASITES OF BALITORIDAE FISHES IN SOME UPSTREAM RIVERS AT KUNDASANG

A study of prevalence of ectoparasites of Balitoridae fishes was conducted at some upstream rivers at Kundasang. The aim of this study was to determine ectoparasites on Balitoridae fishes at Kundasang. Besides that, the study also evaluate the ectoparasites prevalence and intensity on Balitoridae fishes at some upstream rivers at Kundasang. This study will lead action on the conservation action of *Gastromyzon* and *Protomyzon* species in upstream rivers as pollution indicator. The sample of ectoparasites was done by scrapping the mucous of 137 samples of Balitoridae fishes. From the total samples of fishes, 63 are *Protomyzon borneensis*, 63 are *Protomyzon griswoldi* and 13 are *Gastromyzon borneensis*. There were six groups of ectoparasites on the surface of Balitoridae fishes. They were under the group of protozoa *Trichodina spp*, Cestoidean (tapeworm) *Proteocephalus sp*, Nematode (roundworm) *Camallanus sp*, Copepods Crustaceans *Paraergasilus sp*, Branchiura (fish lice) *Argulus sp* and Hirudinae (leeches) *Myzobdella sp*. The highest ectoparasites found on Balitoridae fishes is protozoa *Trichodina spp* which is 507 out of 612 total parasites. Overall, after examine all Balitoridae fishes sample, the prevalence of ectoparasites is 35.04% and intensity of ectoparasites is 12.80. The prevalence of ectoparasite for each species of fishes, *Protomyzon bornensis* are 19.4% *Protomyzon griswoldi* are 51.6% and *Gastromyzon borneensis* are 30.8%.