

Table of Contents

CHAPTER-I: INTRODUCTION-----	1 – 3
1.1 Specific Aims & Objectives of this study	3
1.2 Significance of the Project	3
CHAPTER-II: REVIEW OF LITERATURE-----	4 – 5
CHAPTER-III: MATERIALS AND METHODS -----	6 – 20
3.1 Abundance and distribution of oysters	6 - 7
3.2 Study Area	7 - 8
3.3 Methods of exploitations	8 – 9
3.4 Length-weight relationship of oysters	9 - 10
3.5 Recording of length-weight data	10 - 11
3.6 Determination of length-weight relationships	11 - 12
3.7 Calculating condition factor	12
3.8 Calculation of Condition Index	12 -13
3.9 Biochemical analysis	14 -17
3.10 Statistical analysis	17
CHAPTER-IV: RESULTS-----	18 - 24
4.1 Survey on availability	18
4.2 Exploitation	18
4.3 Monthly variation in proximate analysis	19
4.4 Seasonal variation in biochemical composition	20 - 24
4.4.1 Heavy Metal Content	20
4.4.2 Fatty Acid Content	21
4.4.3 Amino Acid Profile	22
4.4.4 Protein Content	23
4.4.5 Lipid Content	23
4.4.6 Ash Content	24
4.4.7 Moisture Content	24
CHAPTER-V: DISCUSSION-----	25 - 30
CHAPTER-VI: CONCLUSIONS-----	31
CHAPTER-VII: RECOMMENDATION AND FUTURE PERSPECTIVE-----	32
LITERATURE CITED -----	33 - 36

APPENDICES -----	37 - 45
Appendix A Abundance and distribution of oysters along the coastal belt of Bangladesh	37
Appendix B Present status of exploitation of oyster in different regions	38
Appendix C Biochemical data of Oyster during Study period	39
Appendix D Heavy metals analysis of oyster samples	40
Appendix E Seasonal variation of amino acid content of oyster (g/100 g of crude protein)	40
Appendix F Variation of fatty acid content in different seasons	41
Appendix G Multiple Comparison of proximate content in different seasons	42 – 45
Appendix H One-way ANOVA for proximate content in different seasons	45

Authorization

Authorization I hereby declare that I am the sole author of the thesis. I authorize the Chattogram Veterinary and Animal Sciences University (CVASU) to lend this thesis to other institutions or individuals for the purpose of scholarly research. I further authorize the CVASU to reproduce the thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

I, undersigned, and author of this work, declare that the electronic copy of this thesis provided to the CVASU Library, is an accurate copy of the print thesis submitted, within the limits of the technology available.

(Pretom Chowdhury)

ACKNOWLEDGMENT

Thanks to almighty **God** for enabling me to complete this research and write up the dissertation successfully for the degree of Master of Science (M.Sc.) in Marine Bioresource Science under the Department of Marine Bioresource Science, Faculty of Fisheries, Chattogram Veterinary and Animal Sciences University, Chattogram, Bangladesh.

I submit my heartiest gratitude to my respected PI **Dr. Md. Asaduzzaman**, Assistant Professor, Dept. of Marine Bioresource Science and my supervisor **Dr. M.N. Absar Khan**, Professor, Dept. of Fishing and Post-harvest Technology for their sincere guidance for completing this project.

I am deeply indebted to my respected Co-supervisor **Mr. Avijit Talukder**, Assistant Professor and Head, Dept. of Marine Bioresource Science for his help in preparing this thesis.

I humbly extend my thanks to all concerned persons who co-operated with me in this regard.

The Author

June, 2019

LIST OF TABLES

Table No.	Description of the table	Page No.
01	Comparison between permissible limit of heavy metals by WHO, 1989 and metal level found in the present study	26
02	Seasonal variation of Biochemical content of oyster with 95% level of significance	30

LIST OF FIGURES

Figure No.	Description of Figure	Page No.
1	Map of Bangladesh with showing the studied area	6
2	Interview and PRA discussion with the oyster collectors about the abundance and distribution of oyster in Cox's Bazar area	7
3	Latitudinal and Longitudinal direction of Moheskhali Channel	8
4	Exploitation procedure of oysters by the local communities at Moheshkhali channel.	9
5	Collected oysters from Moheskhali Channel and cleaning at the laboratory for further analysis at CVASU	10
6	Marking and tagging of oyster before length-weight measurement	10
7	Measuring length and weight of oyster at laboratory	11
8	Oysters ready for measuring soft-tissue weight and other parameters	13
9	Measuring the oyster shell volume	13
10	Analysis of Proximate Composition in laboratory	15
11	Biochemical content in Oyster flesh in dry basis	19
12	Seasonal Variation of Heavy metal	20
13	Concentration of heavy metals (in ppm dry wt.) in <i>Crassostrea madrasensis</i> .	20
14	Variation of Fatty acid content of Oyster flesh during study period	21
15	Amino Acid Profiling of <i>C. madrasensis</i>	22
16	Variation of Protein content season to season	23
17	Seasonal Lipid Content in oyster flesh in dry weight	23
18	Ash Content of Oyster in Dry weight during study period	24
19	Moisture content variation from season to season	24



Seasonal Variation in the Proximate Composition of Edible Oyster (*Crassostrea* sp.) along the Coastal Region of Bangladesh

Pretom Chowdhury

Roll No. 0118/01

Registration No. 0582

Session: 2018-2019

**A thesis submitted in the partial fulfillment of the requirements for the degree of
Master of Science in Marine Bioresource Science**

Department of Marine Bioresource Science

Faculty of Fisheries

Chattogram Veterinary and Animal Sciences University

Chattogram-4225, Bangladesh

JUNE 2019

Seasonal Variation in the Proximate Composition of Edible Oyster (*Crassostrea* sp.) along the Coastal Region of Bangladesh

Pretom Chowdhury

Roll No. 0118/01

Registration No. 0582

Session: 2018-2019

**This is to certify that we have examined the above Master's thesis and have found that it
complete and satisfactory in all respects, and that all revisions required by the thesis
examination committee have been made**

(Prof. Dr. M.N. Absar Khan)

Supervisor

Department of Fishing and Post-Harvesting
Technology

(Avijit Talukder)

Co-supervisor

Department of Marine Bioresource
Science

(Avijit Talukder)

Chairman of the Examination Committee

Department of Marine Bioresource Science

Faculty of Fisheries

Chattogram Veterinary and Animal Sciences University

Chattogram-4225, Bangladesh

JUNE 2019

Abstract

Oysters are highly esteemed sea food and considered as a delicacy throughout the world. Yet this resource is not optimally utilized in several parts of the world. Quality aspects of oysters (*Crassostrea madrasensis*) in the Moheshkhali Channel, Cox's Bazar were examined in different seasons over a 12 month period spanning March 2018 to February 2019. The aim of this study is to highlight its nutritional importance using biochemical composition analysis and nutritional attributes of oyster meat. Proximate composition, fatty acid and amino acid profiles were determined by following AOAC 1984 & 2000 methodology for biochemical analysis. Oyster meat was rich in macro-minerals and polyunsaturated fatty acids (PUFA) were highest in lipids among whereas, Ecosa-pentaenoic acid, Docosa-hexaenoic acid and Linoleic acid were the prominent fatty acids. The omega-3 is the dominant fatty acid among the different type of fatty acids content in this species. Total amino acid content was 99.33 g/100 g crude protein, of which, essential amino acid lysine was the most abundant. Nutritional quality parameters of oysters were determined at different seasons of the year. Seasonal variations were also observed in the nutrient content, with particular regard to protein 45.27% to 66.92%; Moisture 69.85% to 76.96%, Lipid 6.06% to 9.38% ash 9.32% to 12.61% in oysters. These variations were done due to heavy rainfall, hydrological factor and surface runoff water into the channel. In spite of eco-physiological variability, the nutritional quality of the oysters was generally good, especially just before gamete release when the concentration of nutrients was at its maximum. A low level of fat was detected in the edible meat of oysters. This study is important to comprehend the seasonal variation of proximate composition & heavy metal content of oyster and will be useful for the development of aquaculture technology of the edible oyster. As Oysters form good protein food, a comprehensive knowledge of their biochemical constituents during different seasons of the year would be valuable for large-scale exploitation from natural resources and to promote culture.

Keywords: *Crassostrea madrasensis*, moheshkhali channel, biochemical composition

S