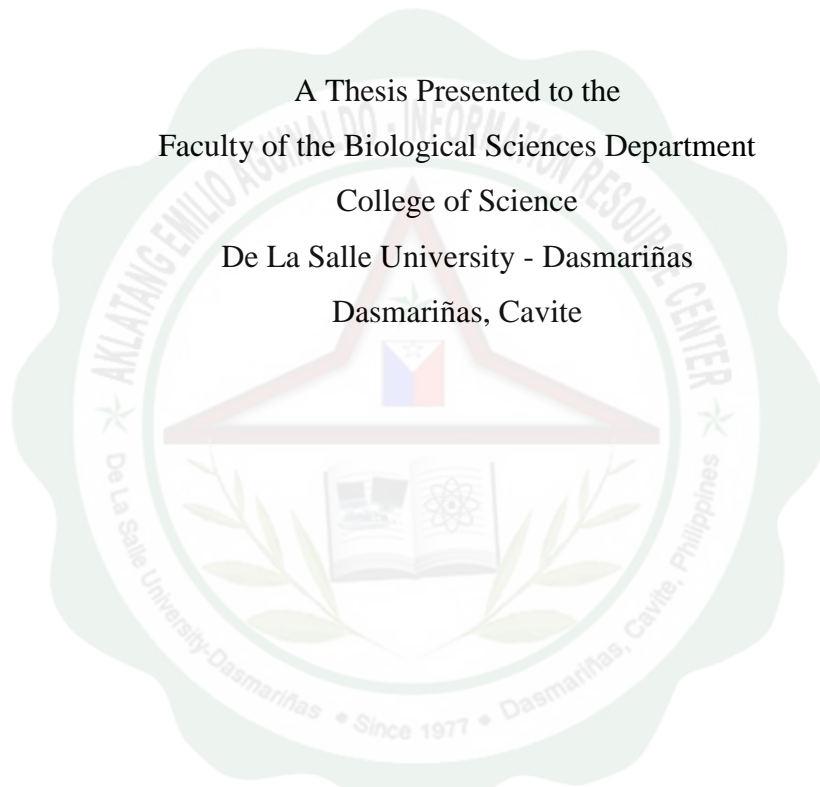




**PRELIMINARY ASSESSMENT OF THE HYPOGLYCEMIC EFFECTS
OF ANTHOCYANIN-RICH *Syzygium curanii* L. (LIPOTE)
FRUIT EXTRACT ON MALE ALBINO RATS**

A Thesis 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

LORRAINE ANN L. BALDO

ELDBERT JED D. PUMA

March 2011



ABSTRACT

Low and high concentrations of anthocyanin extracted from *Syzygium curanii* L. (Lipote) fruit extract exhibited significant lowering effects on diabetic test rats. This study evaluated the potential hypoglycaemic effect of lipote berries on alloxan-induced diabetic male albino rats. Different concentrations of anthocyanin were administered to two groups of rats and its hypoglycaemic effects were compared to a known oral anti-diabetic drug (OAD) – metformin, on a single group of rats. After four weeks of administration, rats were sacrificed and individual pancreas was collected for histopathology. Microscopic examinations were done to observe morphological changes on their beta-cells, the cells principally responsible for the secretion of insulin, a hormone necessary for glucose regulation. Although both concentrations of anthocyanin exhibited hypoglycaemic effects, its ability to lower blood glucose level was not as effective as metformin. This signifies that the concentrations used cannot be recommended as an alternative for metformin. Histopathological results confirmed that aplasia occurs in diabetic rats which were due to the absence of anthocyanin and metformin treatment. On the other hand, those group of rats which are given the said treatments showed only notable morphological alterations (which may affect on their functionality) on their beta-cells.



TABLE OF CONTENTS

Title Page	1
Approval Sheet	2
Acknowledgments	3
Abstract	5
Table of Contents	6
List of Tables	8
List of Figures	9
CHAPTER 1 INTRODUCTION	
1.1 Background of the Study	10
1.2 Conceptual Framework	12
1.3 Statement of the Problem	12
1.4 Scope and Limitations	13
1.5 Significance of the Study	13
1.6 Definition of Terms	14
CHAPTER 2 LITERATURE REVIEW	
2.1 Conceptual Literature	16
2.2 Related Studies	20
CHAPTER 3 METHODOLOGY	
3.1 Research Design	24
3.2 Research Setting	24



3.3 Research Procedure	25
3.4 Data Gathering and Statistical Analysis	27
CHAPTER 4 RESULTS AND DISCUSSION	
4.1 Results	29
4.2 Discussion	35
CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS	
5.1 Conclusions	38
5.2 Recommendations	38
Cited References	40
Appendices	
A. Test plant	46
B. Raw Data	47
C. Figures	51
D. Photodocumentation	52
E. Certifications	59
Curriculum Vitae	60



LIST OF TABLES

TABLE	PAGE
4.1 Effects of anthocyanin-rich Lipote fruit extract on the blood glucose level of male albino rats	29
4.2 Mean rate of Blood Glucose Level Among Four Groups of Diabetic Rats	31
4.3 Blood glucose level of each surviving rat during the pre and post-test experimentation period	47
4.4 Blood glucose level of each surviving rat during the follow-up test (preventive ability of treatments) for the histopathological examinatio of pancreatic beta-cells	48
4.5 Paired t-test of blood glucose level before and after anthocyanin and metformin treatments	49
4.6 Single-factor analysis of variance (ANOVA) between various concentrations of Lipote anthocyanin extract and metformin	49
4.7 Histopathological Effects of Alloxan on Beta-cells Morphology	50



LIST OF FIGURES

FIGURE	PAGE
4.1 Structure of Anthocyanin	17
4.2 Normal beta-cells	32
4.3 Beta-cells that showed aplasia	33
4.4 Notable aplasia on beta-cells	33
4.5 Notable beta-cell destruction	34
4.6 Notable beta-cell destruction	34
4.7 Trend of blood glucose level of each rat before and after treatment administration	51