



**TOXICITY SCREENING OF ALKALOIDS FROM *Tabernaemontana  
pandacaqui* POIR. (PANDAKAKI-PUTI) AND *Voacanga globosa*  
(BLANCO) MERR. (BAYAG-USA) LEAF EXTRACTS  
USING BRINE SHRIMP ASSAY**

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

**GENESIS FAYE ANDAYA  
GLADYS DIANNE HULIPAS**  
March 2012



### ABSTRACT

The alkaloids from *Tabernaemontana pandacaqui* and *Voacanga globosa* leaves were selectively extracted, quantified, and tested for their cytotoxic activity using the Brine Shrimp Lethality Assay (BSLA). The extraction procedures included methanol extraction, Mayer's reagent precipitation, and chemically active solvent extraction. The alkaloid content of the extracts were quantified as milligrams of Vincristine Sulfate Equivalent (mg VSE) using Bromocresol Green Assay. The results showed that the average alkaloid content of *T. pandacaqui* and *V. globosa* leaves are 46.7 mg VSE and 105.3 mg VSE which translated to percent yield of 0.234% and 0.527% respectively. These values may seem very low but taking into context that the standard alkaloid, vincristine from *Cantarantus roseus*, has a percent yield between 0.20-1.0% - the obtained percent yield is comparatively within the normal range of alkaloid yield from plants of *Apocynaceae* family. BSLA studies revealed that the LC<sub>50</sub> values of *T. pandacaqui* and *V. globosa* leaves are of 167 ppm and 40.8 ppm respectively. These values are higher than the LC<sub>50</sub> of vincristine sulfate at 5.03 ppm, which means that they are less cytotoxic than the standard used. However, they are still well within the defined threshold of cytotoxic potency at <200 ppm. This warrants the further investigation of their alkaloid content for their cytotoxic action which may prove useful in cancer chemotherapy.



## TABLE OF CONTENTS

|                                    |    |
|------------------------------------|----|
| Title Page                         | 1  |
| Approval Sheet                     | 2  |
| Acknowledgement                    | 3  |
| Abstract                           | 5  |
| Table of Contents                  | 6  |
| <b>CHAPTER 1 INTRODUCTION</b>      |    |
| 1.1 Background of the Study        | 8  |
| 1.2 Conceptual Framework           | 9  |
| 1.3 Statement of the Problem       | 10 |
| 1.4 Hypothesis                     | 11 |
| 1.5 Scope and Limitation           | 11 |
| 1.6 Significance of the Problem    | 12 |
| 1.7 Definition of terms            | 13 |
| <b>CHAPTER 2 LITERATURE REVIEW</b> |    |
| 2.1 Conceptual Literature          | 14 |
| 2.2 Related Literature             | 20 |
| <b>CHAPTER 3 METHODOLOGY</b>       |    |
| 3.1 Research Design                | 22 |
| 3.2 Research Setting               | 22 |
| 3.3 Research Procedure             | 23 |



|   |    |
|---|----|
| 3.4 Data Gathering and Statistical Analysis | 28 |
| CHAPTER 4 RESULTS AND DISCUSSION            |    |
| 4.1 Results                                 | 29 |
| 4.2 Discussion                              | 32 |
| CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS   |    |
| 5.1 Conclusions                             | 35 |
| 5.2 Recommendations                         | 35 |
| Cited References                            | 36 |
| Appendices                                  |    |
| A. Appendix A: Standard Procedure           | 42 |
| B. Appendix B: Raw Data                     | 47 |
| C. Appendix C: Figures                      | 49 |
| D. Appendix D: Photo Documentation          | 51 |
| E. Appendix E: Time Table                   | 59 |
| F. Curriculum Vitae                         | 60 |