A TAXONOMIC CLASSIFICATION OF FLOWERING TREES IN STATION II AND IV IN MAMBUKAL MOUNTAIN RESORT, MURCIA, NEGROS OCCIDENTAL

A Research Proposal
Presented To:
The Faculty of Philippine Science High School Western Visayas
Bito-on, Jaro, Iloilo City

In Partial Fulfillment
Of the Requirements for
SCIENCE RESEARCH 1

by

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CHAPTER I

INTRODUCTION

A. Background of the Study

The Philippines is one of the most bountiful countries in the whole world when it comes to growth and production of flowering trees. It is because Philippines has an equal distribution of lands on its 7,107 exotic islands with respect to their surrounding bodies of water. The vast lands of the archipelago are topped with fertile sand, which are suitable for plant growth. These fertile lands are the results of the equal distribution of both rain and sun all year round making the soil rich and suitable for the trees to grow.

The Philippine Archipelago is located just above the equator in the tropics. Thus, the Philippines, unlike other countries in the most Northern and Southern part of the world, experiences day and night and is always hit by the ultraviolet rays of the sun. The Philippines is also similar to the wonderful tropical rain forests being annually visited by rain, thus, resulting to good and excellent natural and tropical environment.

The Philippines is like a reservoir of natural environment preserving it to last for a lifetime. A good place as such is the Mambukal Resort in Murcia, Negros Occidental where the researchers decided to do the research and to pass the outputs and findings about the virgin and untouched area. Mambukal is said to be rich in natural resources and great sceneries, like waterfalls and hot springs. The flowering trees of the untouched area are still said to be unknown and maybe undiscovered by environmentalists and agriculturists. Its climate is warm during the day and a little bit cold at night. It is often visited by rains which help in the growth of trees.

The researchers will explore the undiscovered flowering trees found in station II and IV in Mambukal and see if there are still rare species of flowering trees unnamed and undiscovered, which might be native in other places of the world. The researchers would also want to see what kind of flowering trees can grow in the mountains of Mambukal.

Taxonomy is the science of systematically naming and organizing organisms into similar groups. Plants are being classified according to their physical characteristics such as leaf shape, fruit form and all others. The researchers decided to conduct a taxonomic study of the specific area to be aware of the flowering trees that can grow on clay type of soil, on a cold and moist area, and to be familiar about some uncommon flowering trees living in the resort and to add to the knowledge of the researchers and also others that might be able to take hold of the research findings later.

B. Objectives of the Study

This study aims to:

1. Collect samples of flowering trees found in station II and IV in Mambukal.
2. Classify the collected samples.
3. Identify the specimens using taxonomic keys.

C. Significance of the Study

The study is conducted in order to know more about the undiscovered place of Mambukal and all its rich plant life specifically the flowering trees that are found in the terrain. It is also important for the researchers to know the unknown flowering trees so that they can study these trees and learn more about their biological features.

D. Scope and Limitations of the Study

The study will be conducted in station II and IV in Mambukal Mountain Resort in barangay Minoyan, Murcia, Negros Occidental. The researches will examine all flowering trees found in the identified area and will gather tens of their leaves and reproductive structures (if there are any) and take them back to Iloilo City to be preserved and classified. The angiosperms will be identified and classified based on leaf samples and reproductive structures. The gathered samples will be preserved and presented to a consultant from CENRO 8 for identification.

*For samples that could not be preserved, photos will be taken of the plant's leaves and reproductive structures.

The study will be conducted in April-June 2005

After the researchers have gathered all the necessary data that are needed, they will then go to Central Philippine University library to conduct their research about the flowering trees that they have encountered in their two-week stay in the area.

E. Definition of terms

Mounting – is the process when the specimen is glued to the center of the mounting Sheets.

Perennial - A plant that lives for more than a year and produces flowers on more than one occasion. (Latin per, through + annus, a year).

Taxonomy - Science of systematically naming & organizing organisms into similar groups.

Angiosperm – A plant having seeds in a closed ovary.

CHAPTER II

REVIEW OF RELATED LITERATURE

A. Flowering Trees

Trees are perennial seed-bearing plants having an upright wood system, and usually the tallest of plants at maturity. They consist of roots, stem, leaves and reproductive structures (cones and flowers). A tree differs from a shrub in that a tree produces a single main stem, or trunk, unlike shrubs that produce extensions to the stem. Trees' trunks are composed of most entirely of woody tissue while an herb's stem is composed of soft tissue. (Grolier International Encyclopedia, 1991)

Flowering trees are included in the Class Magnoliopsida or Dicotyledoneae (dicotyledons) in the Division Angiospermae or Magnoliophyta except for the family Palmae that is monocotyledonous and a few hundred species. The Class Magnoliopsida has 17 orders that include about 200,000 species. This research will include the Class Magnoliopsida and the family Palmae. Angiosperms are vascular plants. Unlike gymnosperms such as conifers and cycads, angiosperm's seeds are found in a flower. Angiosperm eggs are fertilized and develop into a seed in an ovary that is usually in a flower. The flowers of angiosprems have male and/or female reproductive organs. In angiosperms, the seed is enclosed in sporophylls that form one or more carpels of the ovary, while in gymnosperms, the seed is on the surface of the sporophyll. (http://www.hcs.ohio-state.edu/hort/biology/dangi.html, www.nhptv.org/natureworks/nwep14f.htm)

B. Mambukal Mountain Resort

Mambukal Resort lies 1,200 feet above sea level and serves as a gateway to the Mt. Kanlaon Volcano. Spread over 23.6 hectares, Mambukal is blessed with exceptionally beautiful natural resources. A big mountain stream, fed by several tributaries, descends in a series of seven falls and cuts through the center of the resort, feeding the swimming pools and boating lagoon. Mambukal also boasts a number of hot sulfur springs whose medicinal waters are a balm for the weary flesh and continually feeds the warm dipping pool. It shows that the kind of soil in the place has a great percentage of water in it. Its slopes and dips house interesting rock formations and lush forests of tropical and semi-tropical trees as well as a variety of pines, ferns and orchids that thrive on its cool climate and rich soil, known as Mambukal clay. Philippines is a tropical country but since pines are present in the resort, there can be a chance of the existence of non-tropical trees in the resort. (http://www.negros-occ.gov.ph/mambukal.php)

C. Taxonomy

One of the most useful classification systems is plant taxonomy. Taxonomy is the science of systematically naming and organizing organisms into similar groups. Plant taxonomy is an old science that uses the gross morphology (physical characteristics such as leaf shape, fruit form, etc.) of plants to separate them into smaller groups. Quite often the characteristics that distinguished the plants become a part of their name. The science of plant taxonomy is based on the evolutionary similarities of plants such as chemical make-up and reproductive features. The development of more sophisticated microscopes

and laboratory chemical analyses has made this new science possible. Plants are named using a binomial system. The Genus name comes first and is analogous to a person's last name. The specific epithet name and is a more specific identifier. It would be analogous to a person's first name. Following the genus and species is the cultivar or variety name. This is an even more specific identifier, similar to a person's middle name. When genus and specific epithet are written, they should always be underlined or italicized to denote they are Latin words. However, cultivar and variety names are not italicized. The genus name is always capitalized, but the species name is not. A genus and specific epithet written together denotes a species. In writing, the abbreviation "sp." following the genus indicates a single unidentified species and "spp." indicates multiple species. The "sp." or "spp." is not underlined or italicized. Wild and naturally occurring plants are named under the rules of the *International Code of Botanical Nomenclature*. Cultivated plants are named according to the same principles found in *International Code of Nomenclature of Cultivated Plants.* Genus and species names are universal, being used worldwide. Since taxonomy classifies living organisms, there will be some inconsistencies between books. On the other hand, common names are often local in use and many times don't clearly identify the specific plant. (http://www.ext.colostate.edu/pubs/garden/07701.html)

E. Collection of Specimen Parts

Trees can be taxonomized using its leaves and reproductive structures. Some trees have a unique shape, venation, apex, base, margin, arrangement of leaves and unique arrangement and grouping of its reproductive structures, and in angiosperms, the shape,

number, and arrangement of petals and sepals of plants differ from each other. According to one of our sources, there is no standard procedure for collecting the specimen.

CHAPTER III

METHODOLOGY

A. Materials

1 Pruning Shear

1 Plant cutter

50 pcs. Plastic containers

5 pcs. Markers

2 rolls of Masking tape

Index Cards (3" x 5" and 4" x 6")

1 Field notebook

1 Plant presser

Newspapers

Folders (Long and Short)

Ropes (medium sized, 150m)

Sprays and 3 Wash bottles

2L Denatured alcohol

250mL Formaldehyde

250mL Glycerin

1L Distilled water

B. Methods and Procedures

B.1 Collection of Specimens

The specimens will be collected for six consecutive days in station II and IV in Mambukal Mountain Resort, Murcia, Negros Occidental. The specimens that are located in the area will be labeled as tree #1, tree #2, and so on. The parts of the specimen that will be collected are the leaves and the reproductive structures, the flowers, seeds, and fruits. Other factors like average tree height, flower position, leaf position, special structures of the plant and location of the tree will be noted by the researchers. The researchers will also take photographs of the tree to help with the classification.

Leaves will be collected in tens for each species of tree. The size of the leaves collected will be specified: the leaves will have to be smaller than the size of the paper where the specimens will be pressed in, the size of the plant presser and the size of the mounting sheet. The researchers will take note of the leaf venation and position to help in keying.

Reproductive structures such as fruits, seeds and flowers will also be gathered in tens as they are important to classification. Succulent plant parts (such as fruits) will be photographed and trimmed down to the essentials. The arrangement of the flowers will also be noted by the researchers.

If the tree has special structures, like tendrils, It will also be noted by the researchers.

After each collection, the specimen parts collected will be placed in plastic containers and will be labeled with (a) tree number of the tree from which the part was

collected, (b) date when the specimen was collected, and (c) collection number. These specimens will then be taken to the lab for treating.

B.2 Pressing the Specimen

The specimens will be pressed as soon as possible within a single sheet of newspaper. Using the presser, the specimens will be arranged in the manner that they should appear when dry. The specimens will be arranged in the presser in the following order: newspaper- specimen- newspaper-specimen- newspaper, etc. Only one specimen will be placed in each sheet of folded newspaper. However, small samples of the same specimen will be pressed on the same sheet. The identifying information about the specimen will be written outside the newspaper. Before pressing the specimens on the presser, the specimens will be treated with a solution composed of 2L denatured alcohol, 250mL formaldehyde, 250mL glycerin and 1L distilled water. This solution will prevent immediate deterioration of the specimen and of its parts. After pressing all the specimens, the plant presser will be closed and pressure will be applied by means of tightening the ropes. The specimens will then be allowed to dry under natural conditions. The pressers and newspapers will be changed weekly to prevent destructive molds and insects from preying upon the specimen. The preservation will last for 2 weeks to make sure that the specimens will be completely preserved.

B.3 Recording of Specimen data

When the collection has been made and the specimens properly pressed, field data about the plant will be entered into the field notebook as a permanent record. The information will include the following:

(A) Scientific name,

(B) Common name,

(C) tree number of the tree from which the specimen part was collected

(D) Date when the specimen part was collected, and

(E) Collection number.

The scientific name and common name will be taken with the preserved specimen to an expert in the field
for verification.

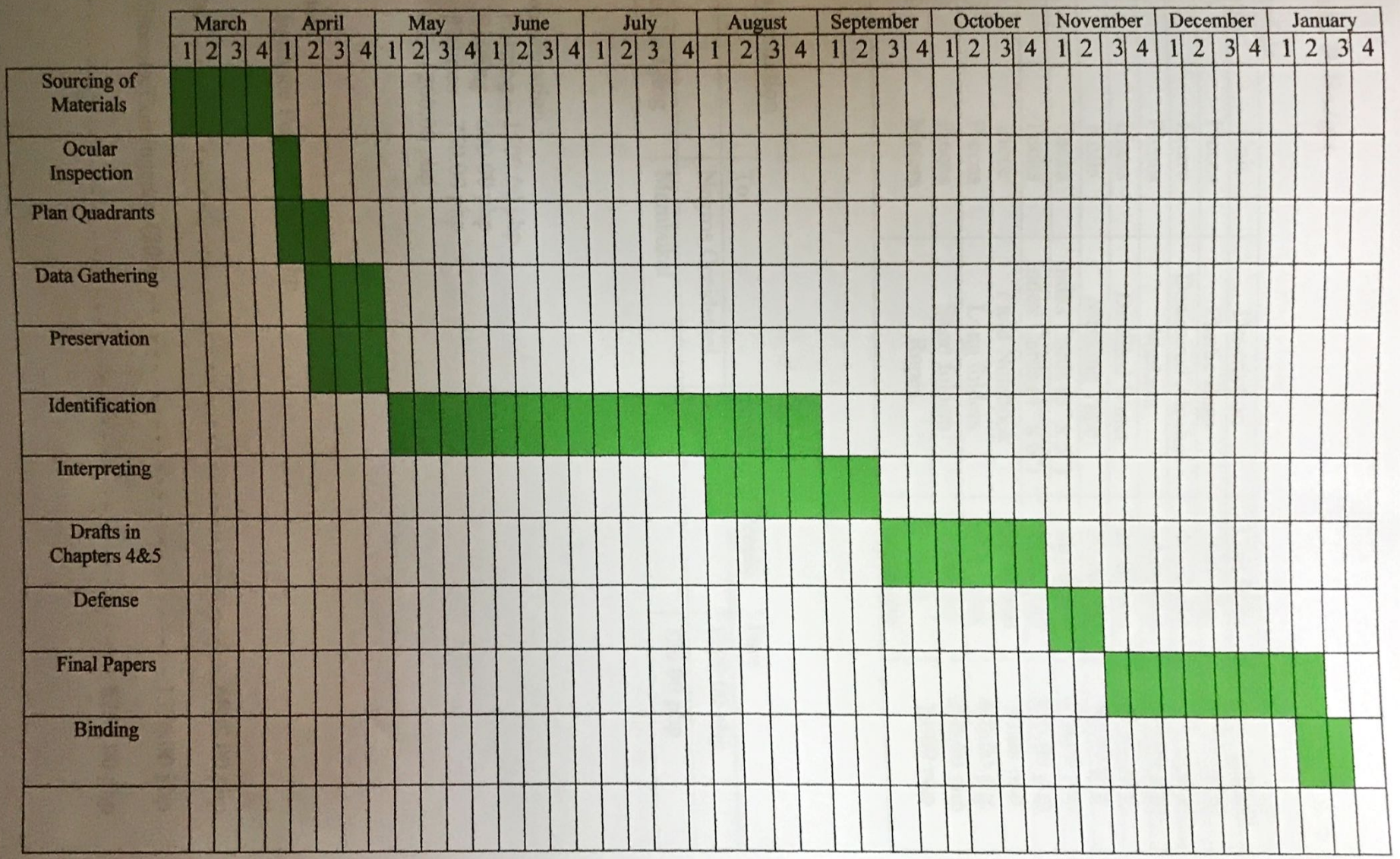
B.4 Mounting the Specimen

The specimen will be glued to the center of the mounting sheet. Small specimen parts will be glued on the short-sized folder while the large specimen parts will be glued on the long-sized folders; clear glue will be applied using inch-wide brushing while pressing all the parts firmly against the mounting sheet. Generally, all the specimen parts will be mounted upright, not horizontally nor diagonally. Extra glue will be removed using a moist cotton ball. When there will be several mounted specimens already, the specimen parts will be filed one on top of the other with a sheet of newspaper in between. Weights will be placed on top of them and the specimen parts will be pressed again so as to make the glue stick well to the mounting sheet.

B.5 Identification of the specimen

Keying will be accomplished using dichotomous keys from certain books from the school library and other libraries such as that of Central Philippine University. Modern technology such as the Internet will also be used to find keys. If possible, expert opinions, advice and verifications will also be asked.

Appendix A. Time Table



Appendix B. Budget

A. Materials

Quantity	Unit	Description	Unit Price	Total Amount
50	Pieces	Plastic Bags	5.00 php	250.00 php
3	Liters	Denatured Alcohol	40.00 php	120.00 php
5	Pieces	Markers	40.00 php	200.00 php
3	Liters	Distilled Water	20.00 php	60.00 php
2	Rolls	Masking Tape	20.00 php	40.00 php
6	Packs	Index Cards (3" x 5")	20.00 php	120.00 php
6	Packs	Index Cards (4" x 6")	25.00 php	150.00 php
1	Piece	Field Notebook	30.00 php	30.00 php
50	Pieces	Long folders	8.00 php	400.00 php
50	Pieces	Short folders	5.00 php	250.00 php
20	Meters	Ropes	1.00 php/meter	20.00 php

B. Transportation

From	To	Number of People	Fare
Iloilo	Negros Occidental	3	1200.00 php
Place of Lodging	Mambukal	3	720.00 php

C. Documentation

Printing – 1500.00 php
Binding – 600.00 php
Pictures – 750.00 php
CD – 200.00 php

D. Others

Entrance Fees – 270.00 php

Subtotal ---------- 6880.00 php

Miscellaneous/Contingency (20%) ---------- 1376.00 php

Total ---------- 8256.00 php

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Gabriel, Melissa Anne T., Jajalla, Tennessee Gospel R., Tabia, Unity Q. "Fern Profile in Cadiao, Barbaza, Antique". Unpublished research paper. Philippine Science High School Western Visayas. February 2000.

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http://www.negros-occ.gov.ph/mambukal.php

http://www.ext.colostate.edu/pubs/garden/07701.html

http://www.elmcare.com/trees/types_of_trees.htm

http://employees.csbsju.edu/SSAUPE/biol308/Course_Materials/Families/gymnos.htm

http://sol.crest.org/renewables/SJ/glossary/P.html

http://www.cogsci.princeton.edu/cgi-bin/webwn

http://www3.gov.ab.ca/srd/land/publiclands/res_glossary.html

http://www.hcs.ohio-state.edu/hort/biology/dangi.html

http://www.nhptv.org/natureworks/nwep14f.htm

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SCIENCE RESEARCH 2
School Year 2005-2006

PARENT'S CONSENT

On behalf of Nidas Angeli L. Zaulda, of minor age and an incoming fourth year student of Philippine Science High School Western Visayas, I, Grazia A L. Zaulda, of legal age , as parent/guardian, hereby give permission to my son/daughter/ward to conduct his/her research work starting April 2005 until March 2006 in and outside the PSHSWV Campus.

I understand that Science Research 2 is a course in the fourth year but since it is a continuation of Science Research 1 in the Third Year, the conduct of the study already begins the summer before his/her senior year.

I am willing to shoulder the expenses needed in the conduct of his/her study.

I am aware of the details of my son's/daughter's/ward's research proposal and I understand the risks he/she might take in the conduct of his/her study. I understand that my son/daughter/ward might work in facilities outside the campus, conduct field studies in aquatic or terrestrial environment, or seek help from other agencies and its representatives. I also know that my child might handle pathogenic organisms and/or chemical substances in the course of his/her work in this study depending on his/her research proposal.

I, therefore, absolve the school, its officials and representatives, as well as any other institution that will extend help, its officials and representatives, of any liability in case any untoward incident may happen to my son/daughter/ward beyond the control of these officials and representatives in the course of the conduct of the study.

Grazia A. Zaulda
GRAZIA ATHENA A. ZAULDA
Signature above Printed Name

03-20-05
Date

09209003471
Contact Numbers

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Grazia C. Zaulda
GRAZIA ATHENA C. ZAULDA
Signature above Printed Name

03-20-05
Date

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Contact Numbers