INVESTIGATING THE PROPERTIES AND SUITABILITY OF NYMPHAEACEAE (WATER LILY) FIBER FOR CONDITIONING BARONG TAGALOG FABRIC STABILITY

A Research Proposal Presented to

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Methods of Chemical Research: Thesis I

By

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Chapter 1

INTRODUCTION

Background of the Study

The textile industry is an essential contributor to the Philippine economy, providing employment and income to thousands of workers and contributing to the country's exports. The Barong Tagalog is one of the most iconic pieces of clothing in the Philippines, and its production is an essential part of the country's textile industry. However, producing high-quality and durable Barong Tagalog fabric has become increasingly challenging due to the scarcity and high cost of materials, as well as competition from cheaper imported fabrics. Therefore, there is a growing interest in exploring locally sourced and sustainable materials.

One potential source of natural fibers is the *Nymphaeaceae* plant family, commonly known as water lilies. *Nymphaeaceae* fiber is a natural fiber that is abundant in many parts of the Philippines, particularly in freshwater lakes and rivers. The fibers are obtained from the stems and leaves of water lilies and have been used traditionally for weaving mats and baskets. However, the potential of *Nymphaeaceae* fiber as a material for fabric production has not been fully explored. This study seeks to investigate the properties and characteristics of *Nymphaeaceae* fiber, particularly its tensile strength, flexibility, and durability, and how it can be integrated into Barong Tagalog fabric production.

To address these challenges, researchers and industry experts are exploring the use of natural fibers that are abundant and locally sourced, such as *Nymphaeaceae* (water lily) fiber. This study aims to investigate the properties and suitability of *Nymphaeaceae* fiber for conditioning Barong Tagalog fabric stability, with the goal of contributing to the development of sustainable and eco-friendly textile materials in the Philippines.

Objectives of the Study

This research thesis aims to determine the potential of water lily fiber as a material for conditioning Barong Tagalog fabric stability. The objectives of this study include:

1. To evaluate the mechanical properties of water lily fiber and determine its suitability for use in Barong Tagalog fabric stability.
2. To investigate the properties of *Nymphaeaceae* (water lily) fiber in stabilizing Barong Tagalog fabric
3. To assess the suitability of *Nymphaeaceae* fiber as a replacement or addition to current materials used in Barong Tagalog fabric production.
4. To identify the potential benefits and challenges of using *Nymphaeaceae* fiber in the textile industry.
5. To provide recommendations for the use of *Nymphaeaceae* fiber in the textile industry.

Conceptual Framework

The conceptual framework for this study is illustrated in the diagram below:

Input:	Process:	Output:
a) Water lily fibers	a) Collection and preparation of water lily fibers b) Testing of mechanical properties of water lily fibers, including tensile strength, elongation, and breaking load using standard testing methods c) Comparison of the mechanical properties of water lily fibers with those of other natural fibers d) Statistical analysis of the data obtained	a) Evaluation of the mechanical properties of water lily fibers and their suitability for use in stabilizing fabrics, including Barong Tagalog fabric b) Identification of the potential benefits and drawbacks of using water lily fibers for strengthening fabrics c) Recommendations for the potential use of water lily fibers in textile production

This framework focuses solely on testing the mechanical properties of water lily fibers, without producing Barong Tagalog fabric samples. The output includes the evaluation of the fibers' mechanical properties and their potential use in stabilizing fabrics, including Barong Tagalog fabric. The study will also identify any potential benefits or drawbacks of using water lily fibers and make recommendations for their potential use in textile production.

Significance of the Study

This study is significant in several ways. Firstly, it provides a new and potentially more affordable option for conditioning Barong Tagalog fabric stability. The use of water lily fiber can reduce the cost of production while still maintaining the quality and durability of the garment.

Secondly, the study can contribute to the development of the local industry by promoting the use of locally sourced and sustainable materials. It will provide new opportunities for local weavers and farmers, particularly those who have access to water lilies as a source of fiber. Water lilies are abundant in the Philippines, and their use can provide additional income for local communities.

Finally, the study can serve as a basis for further research on the potential uses of water lily fiber in other industries. And it will add to the body of knowledge on the properties and characteristics of *Nymphaeaceae* fiber and its potential as a material for fabric production. Water lily fiber has been found to possess excellent mechanical properties and could potentially be used in the production of other textiles and materials.

Scope and Limitations of the Study

The scope of this study is to investigate the properties and suitability of *Nymphaeaceae* fiber for enhancing Barong Tagalog fabric stability. The study will focus on the physical and mechanical properties of the fiber, including its tensile strength, elongation, and flexibility. The study will also investigate the effects of various processing techniques, such as retting and bleaching, on the fiber's properties. However, this study will not cover the production of *Nymphaeaceae* fiber or the actual weaving of Barong Tagalog fabric.

Time and Locale of the Study

The study will be conducted in the laboratory of Cagayan State University, located in Tuguegarao City, Cagayan Province, Philippines. The laboratory will provide the necessary equipment and facilities for the experimental procedures, such as fiber extraction, characterization, and testing.

The water lily samples will be collected from Balzain Creek, located in Tuguegarao City. Balzain Creek is known for its abundance of water lilies, which grow naturally in the area. The water lilies will be harvested and processed to extract the fibers for use in the experimental procedures.

The timeline of the study is subject to change depending on unforeseen circumstances that may arise during the research process. Any changes to the timeline will be documented and communicated accordingly.

By conducting the study in the laboratory of Cagayan State University and collecting the water lily samples from Balzain Creek, this study aims to provide valuable insights into the potential of water lily fibers as a material for conditioning Barong Tagalog fabric.

Definition of terms

- **Barong Tagalog** - a traditional formal shirt commonly worn by Filipino men, typically made of lightweight and sheer fabric such as piña, jusi, or silk.
- **Conditioning**- refers to the process of improving the physical properties of the fabric, such as its strength, durability, and resistance to deformation.
- **Breaking load** - the maximum force required to break a material under a specific testing condition.

- **Elongation** - the percentage increase in length of a material at its maximum tensile strength.
- **Fiber** - a material with a high length-to-width ratio, often used for textile production.
- **Mechanical properties** - physical properties of a material that describe its behavior under applied forces or loads, including tensile strength, elasticity, and toughness.
- **Scanning electron microscope (SEM)** - a type of electron microscope that uses a beam of high-energy electrons to image the surface of a sample.
- **Tensile strength** - the maximum stress a material can withstand before breaking or fracturing under tension.
- **Water lily** - an aquatic plant with large, floating leaves and showy flowers that grows in freshwater ponds, lakes, and slow-moving rivers. In this study, the water lily fibers will be extracted from the plant's stems and tested for their mechanical properties.
- **Fiber extraction** - the process of removing the water lily fibers from the plant's stems and preparing them for testing.
- **Yarn** - a continuous strand of fibers used for weaving or knitting fabrics. In this study, the water lily fibers will be evaluated for their potential use in strengthening fabrics, such as Barong Tagalog, as a substitute for other natural fibers commonly used in textile production.