YAHONG-YAHONG LEAVES AS FISHES FOOD SUBSTITUTE

A SCIENCE INVESTIGATORY RESEARCH

PRESENTED TO THE FACULTY AND STAFF OF FRANCISCO RAMOS NATIONAL HIGH SCHOOL
(FORMERLY BUAYAN NATIONAL HIGH SCHOOL)

In Partial Fullfilment of the Requirement in Capstone under Science, Technology, Engineering and Mathematics (STEM)

Gevashanzy G. Cafino

Jemark S. Villacura

Sofia A. Delos Reyes

Welyn C. Dela Cerna

Headen Rich Spiros B. Lato

Researchers

Republic of the Philippines
Department of Education
Region IX, Zamboanga Peninsula
Division of Zamboanga Sibugay
FRANCISCO RAMOS NATIONAL HIGH SCHOOL
Concepcion, Kabasalan, Zamboanga Sibugay

Certificate of Committee Approval

In partial fulfillment of the requirements, this research paper entitled **YAHONG-YAHONG LEAVES AS FISH FOOD SUBSTITUTE** has been prepared by: **Cafino, Gevashanzy G., Villacura, Jemark S., Delos Reyes, Sofia A., Dela Cruz, Welyn C., Lato, Headen Rich Spiros B.**

Approved by the Examining Committee:

RAMJAY J. CAINGLET
Committee Member

CASSANDHRA PEARL A. EMPERADO
Committee Member

Dedication

This research was truly dedicated to their beloved parents:

Mr. & Mrs. Pejay T. Cafino

Mr. & Mrs. Geraldo D. Villacura

Mr. & Mrs. Gilbert R. Delos Reyes

Mr. & Mrs. Julian C. Dela Cerna

Mr. & Mrs. Henry C. Lato

For their unconditional support that had been the constant source of inspiration, and their advice to their children and teaching them so that the task could be accomplished, not just financially but also on for the encouragement and belief to the researchers that they can finish this research work.

Acknowledgement

The researchers wish to extend their sincere and candor appreciation to this to helped and support their research work, especially to those who in one way contributed to the success of the study.

To our parents who sends us to school, who support us, who gave advice, who loves us unconditionally and inspire us always.

To Mr. Daryl Jay B. Sanco our research teacher, for the patients, encouragement, concern, and intellectual guidance to finish this research.

To our classmates and friends who help, gives happiness and time to treasure unforgettable moments of friendship. To our kind classmate Mr. Axelcris G. Suladay for teaching us valuable insights and criticism that contributes to the success of this research.

While it is impossible to name everyone, who has contributed to this project, we sincerely appreciated the collective effort and collaboration that has shaped this research endeavor.

And above all, to our creator, our God, for the blessing and guidance in the trails that come along our way from the sort of this research with the final presentation of this work.

The Researchers

Table of Contents

List of Figures

List of Tables

Chapter I

Introduction

Background of the Study

Yahong-Yahong leaves *(Centella Asiatica)* is an herbaceous plant commonly found in Asia, Africa, and parts of South America. It has been traditionally used for its medicinal properties, including its ability to improvcognitive function and reduce anxiety. In recent years, researchers have also looked at the potential of using Yahong- Yahong as a feed ingredient for fish.

Yahong-Yahong contain vitamins B and C, proteins, important minerals, and some other phytonutrients such as flavonoids, volatile oils, tannins, and polyphenol. Due to its various medicinal and nutritional properties, it is used as a traditional medicine, as a leafy vegetable, and as a beverage in many countries. The nutritional value of C. asiatica is mainly due to its richness in carotenoids and vitamins C and B complex. The herb is commonly used as porridge for feeding preschool children in Sri Lanka in order to combat nutritional deficiency (Chandrika & Prasad Kumara, 2015).

Despite the promising results, further research is needed to determine the optimal inclusion levels of Yahong-Yahong leaves in fish diets and to evaluate their long-term effects on fish health and performance. Additionally, factors such as cost, availability, and consumer acceptance will be need to be consider before Yahong - Yahong leaves can be widely adopted as a fish feed ingredient.

Statement of the Problem

This study aimed to use Yahong-Yahong Leaves *(Centella Asiatica)* as Fish Food substitute, especially to answer the questions:

- What is the effect of Yahong-Yahong Leaves to the different types of fish?
- What are the nutrients of the Yahong-Yahong Leaves that the different types of fish can gain weight?
- Is there any significance difference between the three treatments of the different type of fish such as Nile Tilapia, Molly, and Barbodes Montanoi in terms of:
    a. Weight
    b. Survival Rate

Objectives

This study aims to use Yahong Yahong leaves as a main material in the production of Fish Food Substitute that targets the recurring environmental issues, specifically:

- to determine the effectiveness of Yahong-Yahong Leaves
- to determine the effect of the nutrients that are present in Yahong-Yahong Leaves
- to determine the differences between the three treatments in terms of weight and the survival rate of the different types of fish such as Nile Tilapia, Swordtail, and Molly fish.

Hypothesis

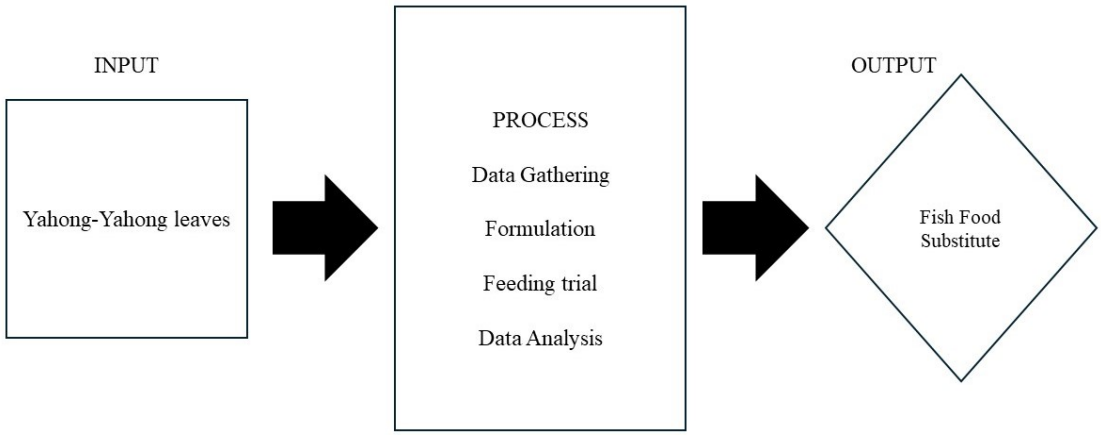
H_o (Null Hypothesis) - There is no significant difference between the three treatment in terms if there weight and the survival rate of the different types of fish before and after feeding.

H_a (Alternative Hypothesis) - There is a significant difference between the three treatment in terms if there weight and the survival rate of the different types of fish before and after feeding.

Conceptual Framework

The concept of this research is to produce Yahong-Yahong leaves as Fish Food Substitute to test their properties. The concept framework is shown below

Figure 1
Conceptual Framework



As shown in Figure 1, the input consists of Yahong-Yahong. The process includes data gathering, formulation, feeding trial, and data analysis. Lastly the output is the result of Fish Food Substitute.

Significance of the Study

Using Yahong-Yahong leaves as fish food substitute can be significant in Nile tilapia, Swordtail and Molly fish because it offers a more sustainable and cost-effective alternative to traditional fish feed. Traditional fish feed is often made from fishmeal, which is derived from wild-caught fish, and can be expensive and contribute to overfishing. In contrast, Yahong-Yahong leaves are readily available and can be grown locally, reducing transportation costs and carbon emissions. The use of Yahong-Yahong leaves as fish substitute is significant because it offers a more sustainable and environmentally friendly alternative to traditional fish feed while also providing the necessary nutrients for fish growth, survival rate, and their development. The use of Yahong-Yahong leaves as fish food substitute has the potential to benefit fish farmers, and consumers to help their fish grow faster and to gain weight.

Scope and Delimitation

This study focuses on making a fish food from Yahong-Yahong leaves. These studies limited on Yahong-Yahong leaves. The size of the product varies from the frame. This study mainly focuses and delimited on the weight and survival rate of different type of fish such as; Nile tilapia, Swordtail fish, and Molly fish, fed with Yahong-Yahong leaves as fish food substitute.

The experimentation will be held in Francisco Ramos National High School (FRNHS) Science Laboratory.

Definition of Terms

For a better understanding of the study, the following terms are defined in the content of this research.

Cornstarch - is a fine white powder that is made from the starchy endosperm of corn kernels. It is commonly used as a thickening agent in cooking and baking because of its ability to thicken liquids when heated.

Digestibility - This term refers to the ease with which fish can digest and utilize the nutrients present in Yahong-Yahong leaves. The digestibility of Yahong-Yahong leaves for fish is not well studied, but some fish species may have difficulty digesting the tough leaves.

Fish - a limbless cold-blooded vertebrate animal with gills and fins and living wholly in water.

Nile tilapia- is widely cultivated for food and aquaculture purposes due to its fast growth rate, adaptability to various environmental conditions, and palatability. Nile tilapia has become one of the most important and widely farmed fish species globally.

Molly fish- They are popular aquarium fish known for their vibrant colors, peaceful temperament, and ease of care. They are livebearers, meaning they give birth to live young instead of laying eggs, and they are omnivorous, feeding on a diet of both plant matter and small invertebrates.

Barbodes Montanoi- is a species of cyprinid fish endemic to the island of Mindanao, the Philippines. It is commonly known as pait, or paitan, along with other native Barbodes species.

Fish Feed - a mixture of various ingredients, including fish meal, grains, and vitamins, that is used to feed farmed fish.

Fish food substitute - refers to any type of food or ingredient that can be used as an alternative to traditional fish food, such as fish meal or pellets.

Fish meal - A processed food product made from ground-up fish that is commonly used as a protein source in animal feed.

Nutritional Value - This refers to the amount and types of nutrients present in Yahong- Yahong leaves that may be beneficial for fish growth and health. Yahong-Yahong leaves are rich in vitamins, minerals, and antioxidants, which may provide essential nutrition for fish.

Palatability - This term refers to how appealing Yahong-Yahong leaves are to fish in terms

of taste and texture. Again, there is little information available on whether fish find Yahong-Yahong leaves palatable or not.

Plant-based protein a protein source derived from plants, such as soybeans, peas, and beans, that is commonly used as an alternative to animal-based protein sources, such as fish meal, in fish feed.

Safety - This refers to whether Yahong-Yahong leaves are safe for fish to consume and whether they may contain any harmful compounds or toxins.

Weight Difference - refers to the variation or change in weight between two different measurements or comparisons. It can be calculated by subtracting the weight at one point from the weight with another point.

Yahong-Yahong leaves -is a plant traditionally used in Chinese and Indonesian medicine. Known as the "Herb of Longevity", this plant is indigenous to the wetlands of Southeast Asia, where is consumed as a juice, tea, or supplement.

Yahong-Yahong leaves meal - a processed form of gotu kola leaves that can be used as a plant-based protein source in fish feed.

Chapter II

Review of Related Literature

This chapter shows the literature that us related to this research this literature review serves as a means to situate our study within to broader academic context and to identify any gaps or areas that require further investigation.

Yahong-Yahong Leaves

Yahong-Yahong leaves *(Centella Asiatica)* have been studied for their potential use as a fish food substitute. A review of related literature suggests that there is a growing interest in the use of alternative feed sources to reduce the reliance on traditional fishmeal-based feeds, which are often expensive and unsustainable also is a herbaceous perennial plant commonly found in Southeast Asia, particularly in India, Sri Lanka, and Thailand. It has been used for centuries in traditional medicine to treat various ailments including cognitive impairment, anxiety, and depression. Recently, there has been growing interest in using Yahong-Yahong leaves as a potential fish feed substitute due to their rich nutritional content.

Feed Additive

Centella asiatica is a herb commonly used for health reasons and known for its medicinal benefits. The study aimed to determine the antimicrobial effects of Centella extract on food, specifically on fish surimi, a perishable food that requires preservatives to extend its shelf life. The extract was added to the fish surimi in two different ways, and the total plate count method was used to determine microbial numbers in the fish surimi with the Centella extract. The disc diffusion method was used to determine the antimicrobial effects of the Centella extract by measuring the inhibitory zone on the media used. The results showed that as the concentration of the extract increased, the total microbial numbers in the fish surimi decreased, and the inhibition zone increased. This proved that Centella extract can inhibit microbial growth on fish surimi, indicating its antimicrobial effect (S. Ismail, Nordin, Z. Ismail, 2024).

Particularly their tendency to snack excessively, which can lead to an overconsumption

of energy. The research aimed to assess the sensory evaluation and nutritional content of tilapia fish meatballs enhanced with gotu kola leaf flour. The study employed a Completely Randomized Design (CRD) with four treatments and three repetitions. The treatments involved making fish meatballs with varying amounts of gotu kola leaf flour: 10g, 15g, 20g, and 25g. The study found that the best fish meatballs were those made with a 5% concentration of gotu kola leaf flour. These meatballs had an energy content of 223.37 kcal, 45.2 grams of protein, 0.29 grams of fat, 10.08 grams of carbohydrates, 62.8% water content, 1.33% ash content, and 2.36% fiber (Mahdalia, Mulyani, Novaria, and Andriyani, 2023).

Growth Performance

The study by Matthews and Gukuta (2022) assessed the effects of gotu kola powder (GKP) on skin mucus, serum immune response, and growth performance of Nile tilapia, Oreochromis niloticus. The study involved 240 Nile tilapia fingerlings fed different levels of GKP for 61 days. Results showed that fish fed 5 g kg-1 GKP significantly improved skin mucus lysozyme (SMLA) and skin mucus peroxidase activities (SMPA). However, no significant differences were observed in SMLA and SMPA in fish fed 10 and 20 g kg-1 GKP compared to the control group. GKP also significantly improved serumlysozyme and serum peroxidase activities compared to the control group. Fish fed 5 and 10 g kg-1 GKP showed a significant increase in alternative complement, phagocytosis, and respiratory burst activities compared to the control group.

Chapter III

Methodology

This chapter present the gathering and preparing of the materials procedure in making an alternative fish food substitute.

Research Locale

The materials used by the researchers were available in Barangay Buayan, Kabasalan, Zamboanga Sibugay. This study was conducted at Francisco, Ramos National High School, Science laboratory.

Materials and Equipment

Materials in making the product

- 60 grams of Yahong-Yahong leaves
- 60 grams of cornstarch
- 9 pieces of fish such as:
  - 3 pieces Nile Tilapia
  - 3 pieces of Molly fish
  - 3 piece of Barbodes Montanoi
- 9 pieces of Basin
- Electronic Balance
- Graduated Cylinder
- Petri Dish
- Sifter
- Spoon/Spatula

Procedure in making the product

First, we gathered Yahong-Yahong leaves (Gotu Kola) and washed with clean water. It was arranged ina cardboard for sun drying. After 2 days of drying, the dried leaves was crushed to smaller size and sifted. The flakes collected from the sifter, was used in making the fish feeds. Three treatments was used to prepare the fish feed for test. Treatment 1: 50ml of water, 10 grams of cornstarch, and 15 grams of Yahong-Yaong leaves. Treatment 2: 50ml of water, 20 grams of cornstarch, and 15 grams of Yahong-Yaong leaves. Treatment 3: 50ml of water, 30 grams of cornstarch, and 15 grams of Yahong-Yaong leaves.

Procedure of the Test

Before feeding the fish with Yahong-Yahong leaves the researcher measured first the weight and the survival rate of the different types fish in order to obtain the weight and the survival rate of the fish before feeding. Each fish tanks were designated as treatments 1,2, and 3. Each treatment as 3 fishes which represents as trial 1,2 and 3. After measuring the weight and the survival rate of the different types of fish, we started to feed them with Yahong-Yahong leaves as fish food substitute, and everyday they are fed twice, in the morning and afternoon with the same amount of fish food substitute which is 2 grams. After 2 weeks we measured the weight and the survival rate of the different types of fish to determine if there is a significant difference between the three treatments in terms of there weight and the survival rate of the different types of fish before and after feeding.

Research Design

This research is Quantitative research using a table to test our product to determine the effectiveness of Yahong-Yahong leaves as fish food substitute. ANOVA was used to determine the significant difference in terms of the weight and a table for the survival rate of the different types of fish before and after feeding.

Table 1
Weight of the different types of fish (Before)

Treatments	Weight (Grams)			Average
	Trial 1	Trial 2	Trial 3	
T1				
T2				
T3				

Table 2
Weight of the different types of fish (After)

Treatments	Weight (Grams)			Average
	Trial 1	Trial 2	Trial 3	
T1: 50ml of water, 10 grams of cornstarch and 20 grams of Yahong-Yahong leaves				
T2: 50ml of water, 20 grams of cornstarch and 20 grams of Yahong-Yahong leaves				
T3: 50ml of water, 30 grams of cornstarch and 20 grams of Yahong-Yahong leaves				

Table 3
Weight difference of the different types of fish

Treatments	Weight (Grams)			Average
	Trial 1	Trial 2	Trial 3	
T1				
T2				
T3				

Table 4
Survival rate of the different types of fish

No. of days	No. of Fish Alive			Total
	Trial 1	Trial 2	Trial 3	
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				
Day 8				
Day 9				
Day 10				
Day 11				
Day 12				
Day 13				
Day 14				
Day 15				

Chapter IV

Results and Discussion

This chapter present the result of an experiment conducted to investigate the potential use of Yahong-Yahong leaves as a substitute for the fish food. The focus of the discussion is on the weight and the survival rate of the different types of fish, which was measured as an indicator of the effectiveness of the substitute. In this study, Yahong-Yahong leaves were tested as a possible substitute, and the result are presented and discussed in this chapter.

Table 5
Weight of the different types of fish (Before)

Treatments	Weight (Grams)			Average
	Trial 1	Trial 2	Trial 3	
T1	4.1	1.07	0.80	1.99
T2	2.28	1.08	0.73	1.36
T3	2.33	2.00	1.33	1.89

In table 7, it shows the observation before the procedure and experimentation, the researchers measured the weight of the different types of fish in each treatment. Treatment 1, weighted 4.1 in trial 1, 1.07 in trial 2, and 0.80 in trial 3, with an average of 1.99. Treatment 2 had a weight of 2.28 in trial 1, 1.08 in trial 2, and 0.73 in trial 3, with an average of 1.36. And the last treatment which is treatment 3 had a weight of, 2.33 in trial 1, 2.00 in trial 2, and 1.33 in trial 3, with an average of 1.89.

Table 6
Weight of the different types of fish (After)

Treatments	Weight (Grams)			Average
	Trial 1	Trial 2	Trial 3	
T1: 50ml of water, 10 grams of cornstarch and 20 grams of Yahong-Yahong leaves	4.9	1.23	1.9	2.68
T2: 50ml of water, 20 grams of cornstarch and 20 grams of Yahong-Yahong leaves	2.56	1.34	1.6	1.83
T3: 50ml of water, 30 grams of cornstarch and 20 grams of Yahong-Yahong leaves	2.43	2.14	1.47	2.01

In table 6, it shows the observation after conducting the procedure and experimentations, the researcher observed that the treatment 1 with 50ml of water, 10 grams of cornstarch and 20 grams of Yahong-Yahong leaves got an average of 2.68. While treatment 2 with 50ml of water, 20 grams of cornstarch and 20 grams of Yahong-Yahong leaves got an average 1.83. And treatment 3 with 50ml of water, 30 grams of cornstarch and 20 grams of Yahong-Yahong leaves obtained an average of 2.01.

Table 7
Weight difference of the different types of fish

Treatments	Weight (Grams)			Average
	Trial 1	Trial 2	Trial 3	
T1	0.8	0.16	1.1	0.69
T2	0.28	0.26	0.87	0.47
T3	0.1	0.14	0.14	0.13

The table shows that treatment 1 had a weight difference of 0.69 for trial 1,2, and 3. In treatment 2 had a weight difference of 0.47 for trial 1,2, and 3. And in the treatment 3 the weight difference is 0.13 for trial 1,2, and 3.

Table 8
Survival rate of the different types of fish

No. of days	No. of Fish Alive			Total
	Trial 1	Trial 2	Trial 3	
Day 1	3	3	3	9
Day 2	3	3	3	9
Day 3	3	3	3	9
Day 4	3	3	3	9
Day 5	3	3	3	9
Day 6	3	3	3	9
Day 7	3	3	3	9
Day 8	3	3	3	9
Day 9	3	3	3	9
Day 10	3	3	3	9
Day 11	3	3	3	9
Day 12	3	3	3	9
Day 13	3	3	3	9
Day 14	3	3	3	9
Day 15	3	3	3	9

The provided table shows a promising initial survival rate for Tilapia, Molly, and Barbodes over two weeks indicating that the provided conditions were generally suitable for this species. This will allow for more comprehensive understanding of the factors influencing survival and over all well-being in these fish species.

Table 9
ANOVA Data Analysis on Results of Weight (Before)

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
T1	3	5.97	1.99	3.3573
T2	3	4.09	1.363333	0.660833
T3	3	5.66	1.886667	0.259633

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.677267	2	0.338633	0.237484	0.795685	5.143253
Within Groups	8.555533	6	1.425922			
Total	9.2328	8				

The ANOVA shows that the P value is greater than the alpha level which is 0.05. Therefore, it enfolds that there is no significant difference between the three treatments in terms of the weight of the different types of fish.

Table 10
ANOVA Data Analysis on Results of Weight (After)

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
T1	3	8.03	2.676667	3.819633
T2	3	5.5	1.833333	0.412933
T3	3	6.04	2.013333	0.242433

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1.183622	2	0.591811	0.396745	0.68893	5.143253
Within Groups	8.95	6	1.491667			
Total	10.13362	8				

The ANOVA shows that the P value is greater than the alpha level which is 0.05. Therefore, it enfolds that there is no significant difference between the three treatments in terms of the weight of the different types of fish.

Chapter V

Conclusion and Recommendation

In this chapter the final decision of the researchers that was formed throughout the study in the suggestion of the researchers to enhance this research.

Conclusion

The following fact has been established the following analysis of results obtained from the experiments described in the above section. In summary:

- The yahong-yahong leaves do not have a strong, measurable impact on the tested types of fish under the conditions of the study.
- Even though the study shows no significant difference in weight gain, nutrients such as vitamins, minerals, proteins, and antioxidant could still be beneficial in other aspects of fish health or under different environmental conditions. The lack of significant weight gain could be due to several factors, such as the dosage used, the baseline health of the fish, or the specific growth parameters measured
- In testing the product, the results of the weight test shows that the p-value is greater than the alpha level. Hence, accepting the null hypothesis that there is no significant difference between the three treatments in terms of weight of the different types of fish, as well as survival rate.

Recommendation

The aforementioned results are used by the researchers to generate suggestions for further improvements of this study. The researchers suggest to:

- Conduct more test to determine the effectiveness of yahong-yahong leaves as fish food substitute;
- Conduct more studies to discover the other uses of yahong-yahong leaves on our daily live;
- Further test the product to the different fish species, to obtain more comprehensive understanding of it's potential as fish food substitute;
- Develop a detailed table of the effects of yahong-yahong leaves on different types of fish such as Nile tilapia, Molly, and Barbodes Montanio;
- Conduct a study changing the variable from cornstarch to yahong-yahong leaves to evaluate its impact

Bibliography

Chandrika, U. G., & Prasad Kumara, P. A. A. S. (2015, January). Chapter four - gotu kola (centella asiatica): Nutritional properties and plausible health benefits. ScienceDirect. Academic Press. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S104345261500056X

Contributors, W. E. (n.d.). Health benefits of gotu kola. WebMD. Retrieved from https://www.webmd.com/diet/health-benefits-gotu-kola

Google Scholar. (2024a). Google.com. Retrieved from https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=gotu+kola+centella+asiatica+for+fish+food+&oq=#d=gs_qabs&t=1710822305882&u=%23p%3DOof0ePmCK5QJ

Google Scholar. (2024b). Google.com. Retrieved from https://scholar.google.com/scholar?as_ylo=2020&q=gotu+kola++%22centella+asiatica%22++for+fish+food&hl=en&as_sdt=0

Google Scholar. (2024c). Google.com. Retrieved from https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=gotu+kola+centella+asiatica+for+fish+food+&oq=#d=gs_qabs&t=1710822744665&u=%23p%3DOof0ePmCK5QJ

Google Scholar. (2024d). Google.com. Retrieved from https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=gotu+kola+centella+asiatica+for+fish+food+&oq=#d=gs_qabs&t=1710822777677&u=%23p%3Dw-UQ8Ay2ZwMJ

Appendices

Appendix A: Request for Permission to Conduct Research

Republic of the Philippines
Department of Education
Region IX, Zamboanga Peninsula
Division of Zamboanga Sibugay
FRANCISCO RAMOS NATIONAL HIGH SCHOOL
Concepcion, Kabasalan, Zamboanga Sibugay

TO: MA. HELEN S. JARCIA
Principal II
Francisco Ramos National High School

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Ma'am:

Good Day!

We are the Grade 11- STEM students of Francisco Ramos National High School. As stated to comply our research study in Practical Research 1 (Quantitative Research) under our Instructor Mr. Daryl Jay B. Sanco.

The proposed topic of our research paper is **YAHONG-YAHONG LEAVES AS FISH FOOD SUBSTITUTE**. We are hereby seeking your consent to conduct a research study in your prestigious school.

Your permission to conduct this study will be greatly appreciated.

Yours sincerely,

Gevashanzy G. Cafino
Jemark S. Villacura
Sofia A. Delos Reyes
Welyn C. Dela Cruz
Headen Rich Spiros B. Lato

Researchers

Noted by:

DARYL JAY B. SANCO

Research Teacher

Appendix B: Certification for Panel of Validation

Republic of the Philippines
Department of Education
Region IX, Zamboanga Peninsula
Division of Zamboanga Sibugay
FRANCISCO RAMOS NATIONAL HIGH SCHOOL
Concepcion, Kabasalan, Zamboanga Sibugay

CERTIFICATION FOR PANEL OF VALIDATION

This is to certify that the attached instrument has been validated and evaluated by the undersigned below and is found to be valid.

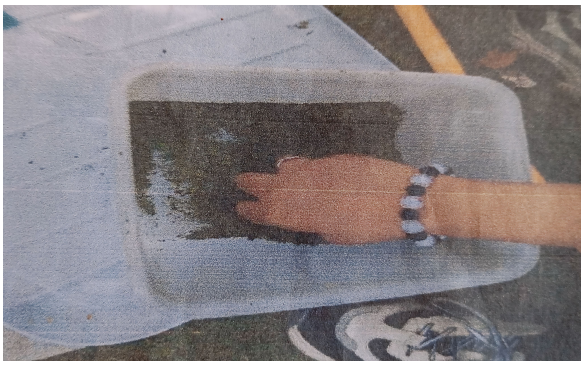
Validated/Evaluated by:

Research Teacher	English Teacher

Appendix C: Photos

Separating the leaves from the stem.

Placing the leaves on the cardboard for sun.



Crushing the dried Yahong-Yahong leaves into small pieces.

Preparing the mixtures.

Molding the mixtures.

Final product.