

## NIPA PALM (*NYPA FRUTICANS WURMB.*) FRUIT PASTA: ITS UTILIZATION AND SENSORY EVALUATION

**EDDILYN A. BUNIEL-PLAZA**

North Eastern Mindanao State University, Cantilan Campus, Cantilan, Surigao Del Sur, Philippines.  
Email: eabuniel@nemsu.edu.ph, ORCID ID: Orcid.org/0009-0000-9206-8720

### Abstract

The Nipa palm, or *Nypa fruticans Wurmb.* as it is scientifically named, is an unusual plant with a specific role in many societies and habitats. The ecosystem and the people who interact with it are significantly impacted by the existence of this unusual palm, which is frequently found in marshes and coastal areas. Nipa palm fruit seemed to be neglected in our community particularly in the municipalities of Cantilan, Madrid, Carmen and Lanuza, Surigao del Sur and that pushed the researcher to utilize its fruit as a main ingredient in pasta making which will then serve as a sustainable income generating product of the people residing in the said municipalities. This study focused on the utilization and sensory evaluation of *Nypa Fruticans* fruit pasta where it utilizes the experimental and descriptive survey research approaches. In assessing its level of acceptability in terms of sensory evaluation, the respondents were randomly selected using the simple random sampling design. The study employed statistical tools to treat gathered data and determine the level of acceptability of the three recipes/mixtures of *Nypa fruticans* pasta. The study revealed that the respondents more likely accepted the 2nd recipe of the pasta with a total mean of 4.11. The 2nd recipe has a 75/25 mixture ratio where 75% of the mixture is the *Nypa fruticans* fruit flour and 25% of which is the wheat flour. This means that consumers liked more the recipe where there is an adequate presence of *Nypa fruticans* fruit flour. Furthermore, the researcher recommends to conduct a follow-up study on the physicochemical properties of the 2nd recipe of *Nypa fruticans* pasta.

**Keywords:** Food Utilization and Innovation, Nipa Palm (*Nypa Fruticans Wurmb.*), Experimental and Descriptive Research Designs, Surigao Del Sur, Philippines.

### INTRODUCTION

Pasta is a widely consumed staple food that is typically made from wheat flour, water, and other ingredients. However, with the growing demand for innovative and sustainable food sources utilizing local materials, there is a need to explore new ingredients for pasta production. One such ingredient is the fruit of *Nypa fruticans*, a tropical plant that is abundant in many coastal regions.

Nipa palm (*Nypa fruticans*) is a useful, versatile, and fairly common component of mangrove forests of Asia and Oceania. Because of its usefulness, it has been introduced into West Africa [2].

*Nypa fruticans* is a palm-like plant that grows in brackish swamps and is commonly known as the nipa palm or mangrove palm. Its fruit is traditionally used in many food and non-food applications, such as vinegar, alcohol, and sugar production [4].

However, the potential of *Nypa fruticans* fruit as an ingredient in pasta production has not been extensively explored. In addition to a host of local subsistence uses ranging from medicines to hats and raincoats, some important commercial uses have led to management efforts and are

initiating a new interest in its potential [6].

Sap production from nipa produces an intoxicating beverage, sugar, vinegar, and alcohol that may be used as fuel. Nipa palm production is the sustainable way to utilize mangrove forest resources, leading to effective conservation and good life quality [7].

Various species of plants in mangrove forest can be potentially processed in many different ways to support the local livelihood, such as food, fuel, medicine, and construction materials [8]. In addition, many local communities inherit traditional techniques for generations to utilize nipa palms that remain a part of the community's livelihood.

Nipa palm fruit seemed to be neglected in our community particularly in the municipalities of Cantilan, Madrid, Carmen and Lanuza, Surigao Del Sur. Hence, this study investigated the feasibility of using *Nypa fruticans* fruit as an additional main ingredient for pasta production. The study involved the experimental processes in utilizing Nipa fruit as a main ingredient in pasta making as well as assessing the sensory evaluation of the Nipa pasta. Further, the results of this study may serve as a sustainable income generating product of the people residing in the said municipalities.

## MATERIALS AND METHODS

### 1.1 Materials

The primary ingredients for making Nipa pasta includes the following: Nipa flour, Wheat flour, Eggs, Salt to taste, and Water. Equipment necessary in preparing the product involves: Mixing bowl, Food Grinder, Rolling pin, Pasta molder, and Boiler/Cooking Pan.

**Table 1: Nipa Pasta Formulations for the three recipe**

<b>RECIPE 1 (50:50 Ratio)</b>	<b>RECIPE 2 (75:25 Ratio)</b>	<b>RECIPE 3 (100% Nipa flour)</b>
1 cup <i>Nypa fruticans</i> fruit flour	1 ½ cup <i>Nypa fruticans</i> fruit flour	2 cups <i>Nypa fruticans</i> fruit flour
1 cup Wheat Flour	½ cup Wheat Flour	2 Eggs
2 Eggs	2 Eggs	1 t Salt
1 t Salt	1 t Salt	½ cup Water
½ cup Water	½ cup Water	

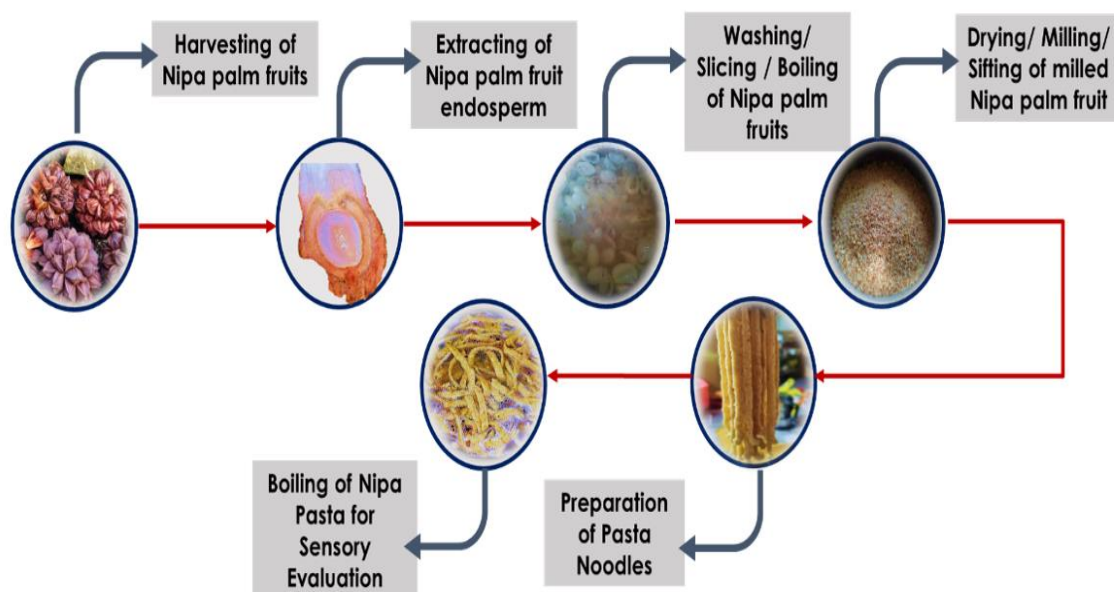
### 1.2 Methods

The study utilized an experimental-quantitative approach. The experimental approach allows the researcher to process the raw materials into a controlled environment before taking it to the consumers for the sensory evaluation while the quantitative approach focuses on the gathering of numerical data to evaluate the sensory acceptability of *Nypa fruticans* pasta.

The preparation and processing of the *Nypa fruticans* pasta was done at Madrid, Surigao del Sur while the sensory evaluation was conducted at the municipalities of Cantilan, Madrid, Carmen, and Lanuza.

The preparation and processing of the *Nypa fruticans* fruit pasta involved the following processes:

- 1.1.1 Harvesting of Nipa Palm fruit – Nipa palm fruits commonly grows at brackish water or near coastal areas. Harvesting Nipa palm fruits requires force since the fruit is covered by a hard shell.
- 1.1.2 Extracting of Nipa palm fruit endosperm – Extracting Nipa palm fruit endosperm requires tool such as sharp knife to ensure an easy and accessible way of extracting fruits.
- 1.1.3 Washing/Slicing/Boiling of Nipa palm fruit – Once the endosperm is extracted, it will be subject for washing, slicing, and boiling. The fruit needs proper washing to remove its slimy texture. Nipa palm fruits should be sliced thinly before putting it into boil.
- 1.1.4 Drying/Milling/Sifting of Nipa palm fruit – After boiling, the fruits are subject for drying utilizing sun drying method. Once the fruits are dried, it will then be subject for milling and sifting to remove unnecessary lumps in flour.
- 1.1.5 Preparation of Pasta Noodles – Once the flour is sifted, it is ready for noodle preparation. Preparing pasta noodle requires equipment such as pasta maker and molder.
- 1.1.6 Boiling of Nipa Pasta for Sensory Evaluation – Once the pasta is molded, it will then be boiled into *al dente* phase to avoid over cooking of the pasta noodles.



**Figure 1: Nipa palm fruit flour preparation and processing**

Meanwhile, the sensory evaluation was conducted through consumer preference testing using random sampling of consumers from the municipalities of Carrascal, Cantilan, Madrid, Carmen and Lanuza, Surigao del Sur. The sensory evaluation tool used was adopted from *Chanadang (2017) Sensory Evaluation and Consumer Acceptability* [3]. The tool uses a five point Hedonic

scale with descriptive measures such as *Like very much (5)*, *Like slightly (4)*, *Neither like nor dislike (3)*, *Dislike slightly (2)*, and *Dislike very much (1)*. Consumers tasted and tested all the three recipe formulations labeled with codes to assess their preference based on the sensory attributes such as Aroma, Appearance, Texture, and Taste. Prior to consumer preference testing, necessary letter request were given to assure that consumer-respondents agreed to participate in the study.

## RESULTS AND DISCUSSIONS

This chapter discusses the presentation, analysis, and interpretation of data gathered by the researcher.

**Table 2: Sensory Evaluation Results**

Indicators	Recipe 1		Recipe 2		Recipe 3	
Aroma	3.91	Acceptable	4	Acceptable	4.05	Extremely Acceptable
Appearance	4.18	Extremely Acceptable	4.28	Extremely Acceptable	4.14	Extremely Acceptable
Texture	4.04	Extremely Acceptable	4.05	Extremely Acceptable	3.92	Acceptable
Taste	3.37	Acceptable	4.09	Extremely Acceptable	3.88	Acceptable
<b>Total Mean</b>	<b>3.69</b>	<b>Acceptable</b>	<b>4.11</b>	<b>Extremely Acceptable</b>	<b>3.99</b>	<b>Acceptable</b>

The table shows that recipe 1 and 3 is acceptable with a total mean of 3.69 and 3.99 respectively while recipe 3 is extremely acceptable with a total mean of 4.11. The study revealed that the respondents more likely accepted the 2nd recipe of the pasta with a total mean of 4.11. The 2nd recipe has a 75/25 mixture ratio where 75% of the mixture is the *Nypa fruticans* fruit flour and 25% of which is the wheat flour. This means that consumers liked more the recipe where there is an adequate presence of *Nypa fruticans* fruit flour. Several studies have investigated the feasibility of using *Nypa fruticans* fruit as an ingredient in pasta production. For example, Barus *et. al.* (2019) assessed the quality of *Nypa fruticans* fruit flour-based spaghetti and found that it had good nutritional properties, including high protein content and low fat content [1]. They also found that the pasta had a unique texture compared to traditional pasta made from wheat flour. Similarly, Halim *et. al.* (2019) evaluated the quality of *Nypa fruticans* fruit flour-based spaghetti and found that it had good cooking properties and acceptable sensory properties, including taste, aroma, texture, and appearance [5].

## CONCLUSION

Based on the results of the study, it was concluded that the *Nypa fruticans* fruit can be utilized as an ingredient in making pasta noodles. Also, the three recipe formulation of *Nypa fruticans* fruit pasta is accepted by the respondents. Additionally, it was the 2nd recipe whom the respondents extremely accepted in terms of its aroma, appearance, texture, and taste. Hence, the results could serve as a basis for future researchers and food innovators as to what recipe formulation should be followed in making pasta made of *Nypa fruticans* fruit. People in the community where *Nipa palm* is abundant could make the results of this study as their basis in

making or preparing pasta noodles which will serve as their additional income generating product. The *Nypa fruticans* fruit pasta could be a sustainable source of livelihood considering the fact that Nipa palm fruit is abundant in the municipalities mentioned above.

**Conflict of interest - Disclose any potential conflict of interest appropriately.**

The authors declare no conflict of interest.

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