

EVALUATION AND ACCEPTABILITY OF TAWA-TAWA (EUPHORBIA HIRTA) CANDY

MAZEDAN INTERNATIONAL J.
OF MEDICAL RESEARCH

e-ISSN: 2583-097X

Article id: MIJMR0202004

Vol-2, Issue-2 (Dec)

Received: 3 Sep 2021

Revised: 4 Oct 2021

Accepted: 13 Oct 2021

PAUL HECTOR E. GONZALES, VIC MARIE L. BORNILLO AND REYMARK S. PABILANDO*

Citation: Gonzales, P. H. E., Bornillo, V. M. L., & Pabilando, R. S. (2021). Evaluation and Acceptability of Tawa-Tawa (Euphorbia Hirta) Candy. *Mazedan International Journal of Medical Research*, 2(2), 15-18.

Abstract

Tawa-tawa (*Euphorbia hirta*) is a pantropical weed; it is a native herb that grows in open grassland, roadsides, and pathways. It is used as traditional herbal medicine. Developing a potential product from tawa-tawa is an innovative way of giving herbal medicine to the public. Besides, tawa-tawa is well-known for treating a variety of illnesses.

This study aimed to develop, evaluate the sensory characteristics and acceptability of Tawa-tawa (*Euphorbia hirta*) candy. It made use of experimental research developing a tawa-tawa candy using sensory evaluation of the 48 respondents testing the product in terms of color, aroma, flavor, texture, compactness, taste, appearance, and its general acceptability of the product developed.

The experimental product sensory evaluation got a weighted mean of 3.3, indicating "Light Brown" when it comes to its product color (inside & outside). In contrast, to its aroma and flavor, the product received a sensory evaluation of 3.4, indicating "Moderately Perceptible Aroma." As to its texture, the product received a weighted mean of 3.8 indicating "Firm, while the compactness of the product received a weighted mean of 2.6 which has a product indicator of "Very Compact." As to its taste, it has received a weighted mean of 4.2 indicating "Moderately Sweet" while its appearance of the product received a weighted mean of 3.8 indicating "Product is good". All in all, the product tawa-tawa candy general acceptability of the 48 respondents participated the test survey has a weighted mean of 7.9 indicating "Likely Very Much".

Keywords: acceptability, sensory evaluation, Tawa-tawa (*Euphorbia hirta*) candy

1. INTRODUCTION

Nature and Importance of the Study

Tawa-tawa is a hairy herb grown in open grasslands, roadsides and pathways. Tawa-tawa, also known as "gatas-gatas" in scientific name "*Euphorbia hirta*". This indigenous plant is considered as one of the most popular folkloric treatments for dengue in the Philippines (dost webpage/news), in which it will treat dengue fever, high blood pressure, digestive health and dewormed, respiratory health, and boosting the immune system.

Intent finding out the truth behind tawa-tawa (*Euphorbia hirta*) curative properties, by the students of the University of Sto Tomas (UST) - Faculty of Pharmacy. In addition, that the study concluded that tawa-tawa (*Euphorbia hirta*) will help improve their healing mechanism. Tawa-tawa (*Euphorbia hirta*) was able to promote cell production and prevents platelet destruction. Thus, its significant findings, won the first prize in the PCHRD-Gruppo Medica Award held during the 6th Philippine National Health Research System (PNHRS) Week held at Sofitel Manila last 10th of August 2012.

Thus, this study will significantly evaluate "tawa-tawa" (*Euphorbia hirta*) candy into two parts. Part 1 is the sensory evaluation in which it will evaluates its

appearances, flavor, and texture. Part 2 is its nutritional tools which will give the evaluation of nutritive value of the tawa-tawa (*Euphorbia hirta*) candy and the last part of this evaluation is food evaluation in which it will improve its dish in terms of methods, ingredients, food presentation and flavoring. In this sensory evaluation it will be participated by the Hotel and Restaurant Management (HRM) student of the College of Tourism (COT) of Biliran Province State University. Naval, Biliran.

Objectives

This study aimed to evaluate tawa-tawa (*Euphorbia hirta*) candy by the Hotel and Restaurant Management student of the College of Tourism, Biliran Province State University, Naval, Biliran. Specifically, it sought to answer the following:

1. Determine its product sensory evaluation in terms of:
 - 1.1. color (inside and outside);
 - 1.2. aroma and flavor;
 - 1.3. texture;
 - 1.4. compactness
 - 1.5. taste, and

1.6. appearance

2. Determine its product general acceptability.

Conceptual Framework

This study takes hold the conceptual frameworks as its main and solid foundations in the due course of its proceedings.

Conceptual framework. This part of the sensory evaluation research presents its conceptual framework, which are composed of three stages, Part 1 are its outputs

which is to developed the product tawa-tawa (*Euphorbia hirta*) candy composed of its materials and ingredients needed and its procedure in developing the candy, Part II the process of evaluation which distributed and test the developed product by the 48 participating student in terms of its color (inside and outside) aroma and flavor, texture, compactness, taste, appearance and its general acceptability of the public, and lastly Part III which presents its sensory evaluation results conducted to 48 students participated in the evaluation of the tawa-tawa (*Euphorbia hirta*) candy.

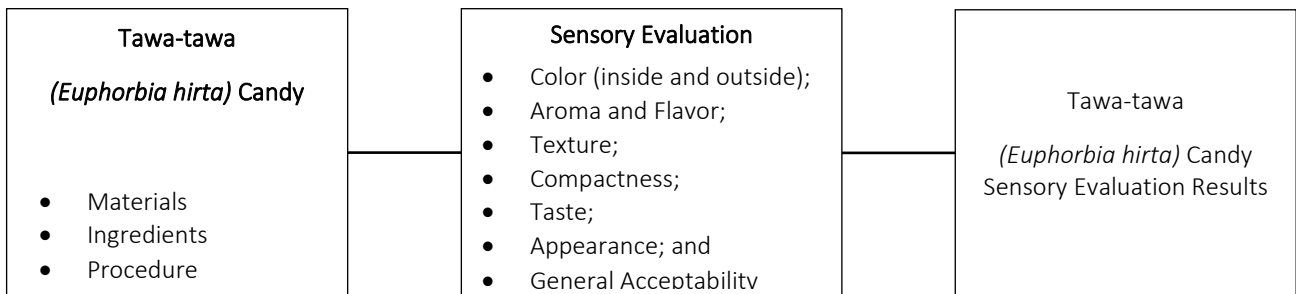


Figure 1 The Conceptual Framework of the Study

2. METHODOLOGY

This chapter presents the methods and procedures on how the study was undertaken. In which this chapter discusses research design, research locale, research respondents, research instruments, data gathering procedure, statistical analysis and data scoring.

Research Design and Sampling

The research design used on this study is descriptive method; descriptive method is used to describe characteristics of a population or phenomenon being studied. Descriptive method intended to look into the evaluation of sensory nutritional tools of food components composition table, and food evaluation improving dish.

The study was conducted at Biliran Province State University Main Campus, College of Tourism of Naval, Biliran Province, Philippines.

The research respondent of this sensory evaluation research was the 48-participating student of the Bachelor of Science in Hotel and Restaurant Management of the College of Tourism, Naval State University Main Campus.

Data Collection Procedures

Before research conducted the researchers sought clearances to conduct study of the administering dean, chairman and etc, which the researchers will distribute its evaluation for data analysis Data collected shall be treated and transform into table, figures and charts to simply state the results of the evaluation study.

The instrument used in this study was formulated using sensory evaluation which distributed to the student of the Bachelor of Science in Hotel and Restaurant Management student.

Tools and Equipment needed on this sensory evaluation are measuring cup measuring spoons, ladle, pan, casserole while its materials needed in developing the products are 4 cups of extra boiled tawa-tawa 1 cup of condense, % cup of sugar, 1 tbsp of butter and 4 pcs egg yolk. In developing the tawa-tawa candy the researchers had followed the following procedure ensuring the quality of the product:

1. First, wash thoroughly the tawa-tawa, then in the casserole.
2. Add 6 cups of water and put the tawa-tawa boiled it for 20-30 minutes;
3. Prepare other ingredients while waiting the tawa-tawa boiled extra;
4. In the pan, put the tawa-tawa boiled extra
5. Add the condense and sugar stir it in one direction after 5 minutes add the 1tbsp of butter and egg yolk and stir it until it caramelized or sticky.
6. Put it in the plate and cool it lightly, and
7. Then wrap the candy

Data Analysis

The sensory evaluation was scored and treated by means of mean which was used in determining the level of acceptability of its color, texture, compactness, aroma flavor, taste, moistness, appearances and its general acceptability. The following scale and description were used:

Table 1 Product Color (inside & outside)

Scale	Mean value	Description
4	3.4 - 4.0	Dark Brown
3	2.5 - 3.3	Light Brown
2	1.8 - 2.4	Pale Brown
1	1.0 - 1.7	Yellowish

Table 2 Aroma and Flavor

Scale	Mean value	Description
4	3.4 - 4.0	Very Perceptible Aroma
3	2.5 - 3.3	Moderately Perceptible Aroma
2	1.8 - 2.4	Slightly Perceptible Aroma
1	1.0 - 1.7	Absence of Aroma

Table 3 Texture

Scale	Mean value	Description
4	3.4 - 4.0	Soft but Firm
3	2.5 - 3.3	Firm
2	1.8 - 2.4	Very Soft
1	1.0 - 1.7	Soft and Mushy

Table 4 Compactness

Scale	Mean value	Description
3	2.1 - 3.0	Product is Good
2	1.2 - 2.0	Moderately Like the Product
1	1.0 - 1.5	Soft and Mushy

Table 5 Taste

Scale	Mean value	Description
5	4.3 - 5.0	Very Sweet
4	3.4 - 4.2	Moderately Sweet
3	2.5 - 3.4	Just Right
2	1.8 - 2.4	Slightly Sweet
1	1.0 - 1.7	Bland

Table 6 Appearances

Scale	Mean value	Description
4	3.4 - 4.0	Product is Good
3	2.5 - 3.3	Moderately Like the Product
2	1.8 - 2.4	Slightly Like the Product
1	1.0 - 1.7	Likely Dislike the Product

Table 7 General Acceptability

Scale	Mean value	Description
9	8.2 - 9.0	Likely Extreme
8	7.3 - 8.1	Likely Very Much
7	6.4 - 7.2	Likely Moderately
6	5.5 - 6.3	Likely Slight
5	4.6 - 5.4	Neither Like or Dislike
4	3.7 - 4.5	Slightly Dislike
3	2.8 - 3.6	Moderately Dislike
2	1.9 - 2.7	Very Much Dislike
1	1.0 - 1.8	Extremely Dislike

The statistical used in this study was the weighted mean, in which a weighted mean is being averaged multiplied by a number (weight) based on the item's relative, which are used extensively in descriptive statistical analysis such as index numbers used in this sensory evaluation.

3. RESULTS AND DISCUSSION

This part of the chapter presents the results and discussion of the sensory sheet evaluation of tawa-tawa candy.

Sensory Evaluation

This part discusses its sensory evaluation of the tawa-tawa candy on its color, aroma, texture, flavor, compactness, moistness, appearance and its general acceptability of the tawa-tawa candy.

Table 8 Table 1 Color of the Product

Variable	WM	Description
Color (Inside)	3.3	Light Brown
AWM		

Color (Outside)	3.3	Light Brown
AWM		

Table 8 shows the weighted mean of the product color (inside and outside) which has a weighted mean of 3.3 with an product indicator of "Light Brown", that has a total weighted mean of 3.3 equal to its product indicator of "Light Brown" when it comes to its tawa-tawa candy color Which accord to the article writing of Katrina C (July 2015) that the color analysis played a vital role in food production, in the fact that color of the product to consumer me attract to purchase and buy its product such example, in the early 1900's Pepsi Cola released a new line of clear colored cola products that boasted less artificial coloring and no caffeine, in which it increases their consumer demand and product of the said product.

Table 9 Aroma and Flavor of the Product

Variable	WM	Description
Aroma	3.3	Moderately Perceptible Aroma
AWM		
Flavor	3.4	Moderately Perceptible Aroma
AWM		

Table 9 shows the aroma and flavor of the product, in which it shows the weighted mean of aroma that has a mean of 3.3 equivalent to its indicator of moderately perceptible aroma, while its flavor has a mean of 3.4 equivalent to its indicator of very perceptible aroma, all in all its total weighted mean of 4 with a product indicator of moderately perceptible aroma of the tawa-tawa candy. Thus, this implied to the study of H. Lawless (1990) that the sense of taste and smell is one of the contributing factors in sensory evaluation survey, thus it will illustrate its important factor characteristics of the products, in which it describes the respondent judgement to the test product of the tawa-tawa candy when it comes to its aroma and flavor.

Table 10 Texture of the Product

Variable	WM	Description
Texture	3.3	Firm
AWM		

Table 10 shows the weighted mean of 3.3 equivalent which indicating "firm" when it comes to the texture of the product tawa-tawa candy. In which it is implied contributes to an overall acceptability of a sensory evaluation which describe the to the study of Laura M. Hansen and Carole S. Setzer (2007) that product texture customer evaluation regarding to its texture during its test evaluation.

Table 11 Compactness of the Product

Variable	WM	Description
Compactness	2.6	Very Compact
AWM		

Table 11 compactness of the product shows its weighted mean of 2.6 equivalent to very compact, which has a total weighted mean to its product compactness of the product of tawa-tawa candy. Which accord implication in the study of Barranchina (2007) state the sensory evaluation in food, typically to compactness of the product quality control instrument technique against imitations provided with the test survey of its compactness of the tawa-tawa candy.

Table 12 Taste of the Product

Variable	WM	Description
Taste	4.2	Moderately Sweet
AWM		

Table 12 taste of the product shows the weighted mean of 4.2 which has an indicator of moderately sweet to the taste of the product tawa-tawa candy. It implied to the study of Sharon L. Melton (2007) defining the discipline used to invoke, measure, analyzed, and interpret reactions of its characteristics in foods by evaluating taste of sensory evaluation of the tawa-tawa candy

Table 13 Appearance of the Product

Variable	WM	Description
Appearance	3.8	Product is Good
AWM		

Table 13 shows how appreciable when it comes to its appearance the tawa-tawa candy is, which it got a corresponding weighted mean of 3.8 that has an indicator of "Product is Good", in which it is stated on the study of Harry T. Lawless and Hildegard Heyman (2007) that food products appearances is the primary indicators of perceived quality. The importance of appearances can also be demonstrated when we think of a product.

General Acceptability of the Product

This part of the sensory evaluation presents its general acceptability of the product in terms of its color (inside and outside), aroma, flavor, texture, compactness, taste and appearances of the tawa-tawa product which has been developed

Table 14 General Acceptability

Variable	WM	Description
General Acceptability	7.9	Likely Very Much
AWM		

Table 14 shows how the respondents of 48 accept the product of tawa-tawa candy which has gathered a weighted mean of 7.9 that has a product indicator of hink "Likely Very Much" which indicate a general acceptability of the product on the public during the conduct of test sample survey of the product. All in all, the general weighted mean of the conduct survey is 7.9 indicating "Likely Very Much of the product created.

4. CONCLUSIONS AND RECOMMENDATIONS

This part of the sensory evaluation research of tawa-tawa candy presents its conclusions and recommendations of the product sensory evaluation.

The developed product of tawa tawa to candy has been concluded into its color (outside and inside), aroma flavor, texture, compactness, taste, appearance and its general acceptability and based on the result of this study the tawa-tawa candy was likely very much acceptable to the Biliran Province State University.

The researchers have recommended the following for further study of the development/invented product which is the tawa-tawa candy in terms of-

1. Sensory evaluation outside the campus for the community to determine:

2. Evaluate the product general acceptability of the community, and
3. Evaluate and determine its product marketability.

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