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SENSORY EVALUATION OF PASINORIA FRUIT (PASSIFLORA FOETIDA LINN): A JUICE DRINK

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ABSTRACT

The Passiflora Foetida Linn were used as the main ingredients in development of fruit drink. The amount of extracted syrup, high fructose corn syrup (HFCS), granulated sugar, distilled water may affect the overall taste, color/ appearance, and odor of the fruit drink. The assessment was carried out to develop the acceptable prepared Passiflora Foetida Linn Fruit Drink using different amount of extracted syrup (35%, 40%, 45%, 55%, 65%) of Passiflora. The different parameters in sensory evaluation were analyzed. The acceptability of five trial samples was increase the overall acceptability of the respondents with the average mean of 7.75, verbal interpretation of like very much, with 65% percent of extracted syrup of Passiflora Foetida Fruit. Trial 5 was the most preferable in terms of overall acceptability. The research may give some of the suggestion, by enhancement of the process in the developed fruit drink with the standard of 65% of Passiflora Foetida Linn extract that can retain the essence of natural flavor and nutritional content, additional microbiological and nutritional analysis may help for the safe and further increase the overall palatability and safeness of the Passiflora Foetida Linn Fruit Drink.

KEYWORDS: *Passiflora Foetida Linn taste, color/appearance, odor, quality, beverage*

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INTRODUCTION

Passiflora Foetida (common names: stinking passionflower, wild maracuja, bush passion fruit, wild water lemon, stone flower, love-in-a-mist, or running pop) is a species of passion flower that is native to the southwestern United States (southern Texas and Arizona), Mexico, the Caribbean, Central America, and much of South America.

It has been introduced to tropical regions around the world, such as Southeast Asia, South Asia, Hawaii, Africa, and The Maldives. It is a creeping vine like other members of the genus, and yields an edible fruit. The specific epithet, *Foetida*, means "stinking" in Latin and refers to the strong aroma emitted by damaged foliage. This passion flower tolerates arid ground, but favors moist areas. It is known to be an invasive species in some areas. This plant is also a widely grown perennial climber, and has been used in traditional medicine (wikipedia.org, 2021).

In the present study of (Sunilkumar, 2019) the preliminary phyto-chemical analysis showed the presence of alkaloids, flavonoids, proteins, cholesterol tannins, carbohydrates, fat, amino acid and phenol. The fruit also contained appreciable amount of minerals such as Calcium, Magnesium, Phosphorus etc. It has been reported that alkaloids and flavonoids were responsible for the anti-inflammatory and anti-nociceptive activity of Prostaglandin synthetase inhibition. Therefore, anti-inflammatory and antinociceptive activity of the fruit extract may be attributable to the existence of Alkaloids *Foetida* Linn. Plant extracts: biological and pharmacological activities.

People around the world love drinking ready to drink beverages, especially for those in schooling and in their work. Because some of people are now health conscious hungry that they can get nutrients from what they eat and drink. Fruit and vegetable juices are popular and healthful drinks for their nutritional value. Fresh juices contain antioxidants, vitamins and minerals that are essential to promote healthy life in human beings and they also play an important role in the prevention of many diseases.

The research, shows that there is a growing demand for products that address a broad spectrum of health concerns, but in particular immunity and mental health support. While immune health is top of mind at the moment and is the most important health concern since the onset of the pandemic, younger age groups are worried about body-mind wellness and their mental health, meaning that there is an opportunity to create products to address these concerns." As the market for products with functional and nutritional benefits grows, that there is increasing consumer demand for formats that meet the needs of different occasions and deliver ease and convenience of consumption. The research also found that just over half of all Europeans attach equal importance to taste and delivery of the benefit. The functional beverage market is projected to grow at a compound annual growth rate (CAGR) of more than six percent through to 2025 as more consumers reach for beverages with added benefits. (Minchin, 2021).

This is the opportunity to create iconic products is still ahead of us. Brands will need to communicate the key benefits of the products while also delivering on taste and texture. Some of consumers are willing to pay a premium for beverages with a functional benefit and will repurchase if that benefit is proven to work. This means that manufacturers, developers, and innovator need to use ingredients that are backed by science and trusted by consumers.

OBJECTIVES OF THE STUDY

The purpose of this study were to developed Passiflora Foetida L Nutri-fruit drink and evaluate the sensory evaluation of the Nutri-fruit drink.

Specifically, this study aimed to:

1. To process and formulate of Passiflora Foetida L Nutri fruit drink
2. To conduct sensory evaluation of process Passiflora Foetida L Nutri fruit drink

SCOPE AND DELIMITATION

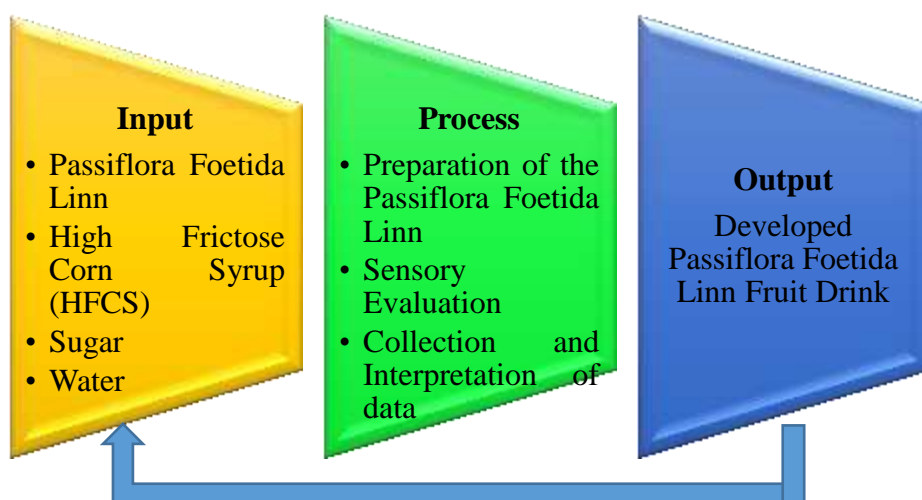
This research study was conducted to develop and formulate Passiflora Foetida Linn Fruit Drink out of exotic and native fruit. The specification of materials to be used was suited to their availability in the market are included in the formulation.

CONCEPTUAL FRAMEWORK

The study used the IPO or Inputs, Process and Output to determine what will be its outcome after it is being processed. As input, the Passiflora Foetida Linn, High Fructose Corn Syrup, Sugar, and Water. The process is done through the processing of Passiflora Foetida Linn. Also, it includes the process on extracting, mixing, and pasteurization and sensory evaluation. The outputs of the study will be developed Passiflora Foetida Fruit Drink.

The **Input-Output (IPO) Model** is a functional graph that identifies the inputs, outputs, and required processing tasks required to transform **inputs** into **outputs**. The model is sometimes configured to include any storage that might happen in the process as well. The inputs represent the flow of data and materials into the process from the outside. The processing step includes all tasks required to effect a transformation of the inputs. The outputs are the data and materials flowing out of the transformation process. (Sixsigmadaily.com, 2012)

The model represents a dynamic, flexible guideline for developing product. The different phases of IPO input, process, and output provide a road map for the entire process of developing the Passiflora Foetida Fruit Drink.



Feedback

Figure 1. Research Paradigm

SIGNIFICANCE OF THE STUDY

The findings of the study may be relevant and/or great value to the following:

Beverage Industry. To provide inputs in utilizing exotic fruits in the Philippines in creating new products categories to sustain the customers wants and needs.

Local Government Officials. They are also the targets in which the Passiflora Foetida Nutri-fruit drink may be beneficial with the current problems in livelihood and health risk. This product will provide business to local farmer and household.

Researcher. In this study, the researcher specifically the writer of this study may utilize and improved the process, nutritional content, shelf life and other uncover critical areas. Thus, a new way of producing nutritive fruit juices.

Future Researcher. The study could pave the way to future related studies. Researchers could utilize the concepts in the study as bases for their own.

MATERIALS AND METHODS

This chapter discusses the research design, the locale, population, instruments, data gathering procedure, and the analysis used in the development of Passiflora Foetida L. Nutri - Fruit Drink for Food Technology Students and Teacher in Industrial Technology.

Research Method Used

This study utilized the mixed method design combining both experimental and descriptive research. The experimental research was used to determine the right formulation of the fruit juice through the use raw materials. Experimental design is the process of carrying out research in an objective and controlled fashion so that precision is maximized and specific conclusions can be drawn regarding a hypothesis statement. Generally, the purpose is to establish the effect that a factor or independent variable has on a dependent variable (Sciencedirect.com, 2009).

According to the Sensorysociety.org, (2022), The most widely used scale for measuring food acceptability is the 9-point hedonic scale. David Peryam and colleagues developed the scale at the Quartermaster Food and Container Institute of the U.S. Armed Forces, for the purpose of measuring the food preferences of soldiers. The scale was quickly adopted by the food industry, and now is used not just for measuring the acceptability of foods and beverages, but also of personal care products, household products, and cosmetics. The researcher used a nine-point hedonic scale for overall acceptability of developed Passiflora Foetida Fruit Drink where weighted average was computed to determine the equivalent scale rating chosen by the participants.

Rating Scale	Point Distribution	Verbal Interpretation
9	8.01 – 9.00	Like Extremely
8	7.01 – 8.00	Like Very Much
7	6.01 – 7.00	Like Moderately
6	5.01 – 6.00	Like Slightly
5	4.01 – 5.00	Neither Like or Dislike
4	3.01 – 4.00	Dislike Slightly
3	2.01 – 3.00	Dislike Moderately
2	1.01 – 2.00	Dislike Very Much
1	0.01 – 1.00	Dislike Extremely

Statistical Analysis

A total enumeration was used to select the 5 food technology teacher-respondents. And random sampling method was used to select 15 respondents of students, four in each of year level from first year to fourth year. There responses were analyzed by computing the weighted mean and the corresponding results were interpreted.

Respondents of the Study

The target population of the study included the following:

Prior to the development of the Passiflora Foetida Fruit Drink was assessed by the Food Technology Student and Faculty of College of Industrial Technology in Nueva Ecija University of Science and Technology. The total enumeration of teacher respondents

Table 1
Distribution of the Respondents by Classification

Classification	Sample	Percentage (%)
Teacher	5	25
Students	15	75
Total	20	100

Table 1 has the students and teacher-respondents that are composed of fifteen (15) food technology students and five (5) food technology teacher in the College of Industrial Technology in Food Technology Major.

1. Materials

1.1 Formulation of Passiflora Foetida Fruit drink

Table 2 Trial Samples of Passiflora Foetida Fruit drink

Ingredients		T1	T2	T3	T4	T5
1	Passiflora Syrup	35g	40g	45g	55g	65g
2	High Fructose Corn Syrup (HFCS)	15g	15g	15g	15g	15g
3	Granulated Sugar	15g	35g	35g	35g	35g
4	Distilled Water	300g	300g	300g	300g	300g

The formulation of Passiflora Foetida Linn Fruit Drink was based on the availability of the resources, came from various area in Batitang Zaragoza Nueva Ecija. Various trials were made to improve the process, taste, color, appearance and texture of the fruit drink.

Ripe Passiflora Foetida Linn were collected from various area in Batitang Zaragoza. Granulated Sugar, High Fructose Corn Syrup (HFCS), Distilled Water, and Glass Bottle were purchased from the local market. Other tools (thermometer, mixing bowl, digital thermometer, wire whisk, ladle, strainer, serving bowl, used in study were sanitized and available in food technology laboratory.

1.2 Processing of Passiflora Foetida Nutri-fruit drink

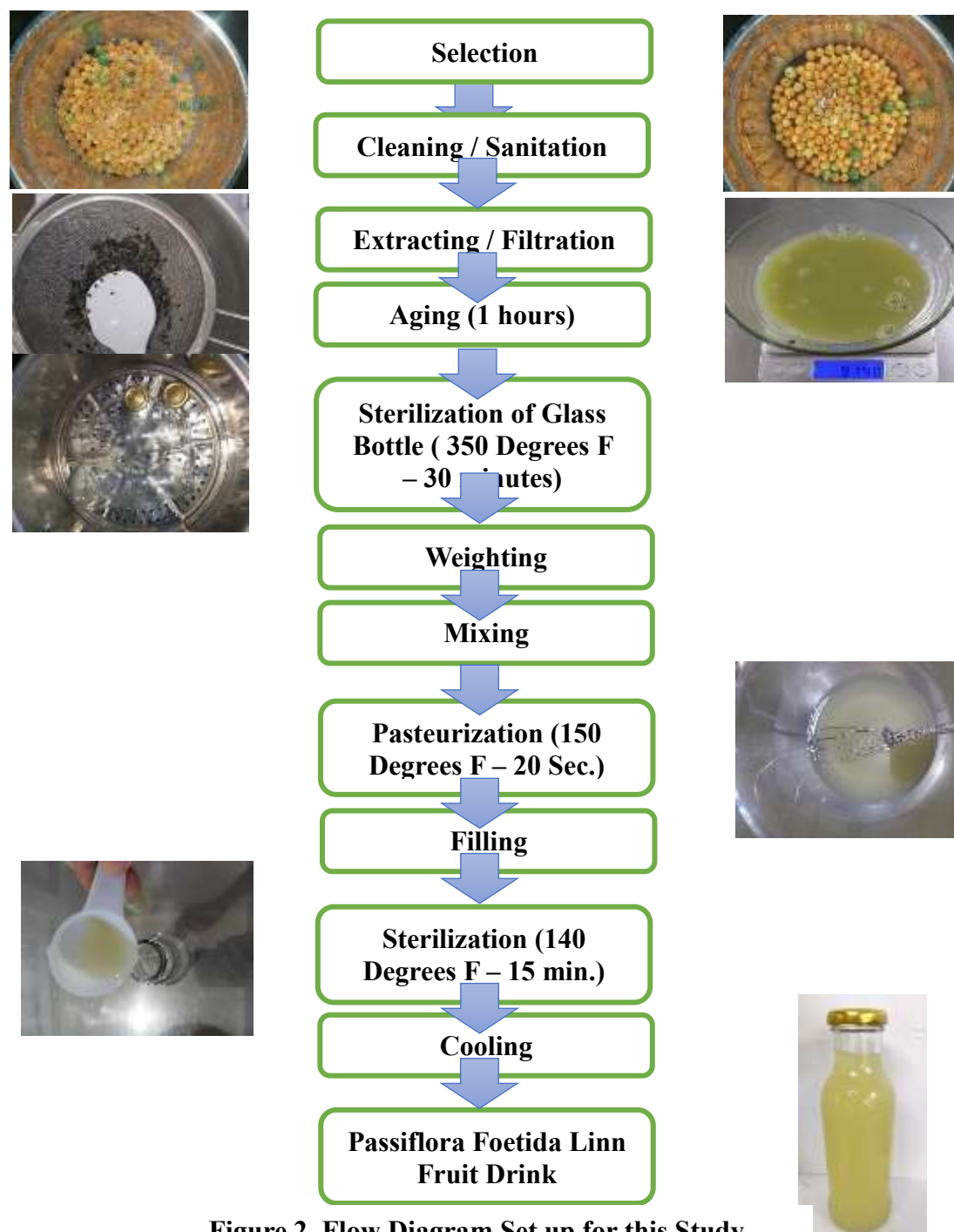


Figure 2. Flow Diagram Set up for this Study

Procedure:

1. Selection of Passiflora Foetida fruit were the same mature, no pest, uniform size.
2. Cleaning and Sanitation to eliminate other present microorganism to ensure that is safe for processing to avoid contamination.

3. Extracting of Passiflora Foetida Fruit Juice by adding water until the green color has shown. Filtering using sifter that will help to retain the pulp of the Passiflora seeds.
4. Aging syrup for 1 hours that help to make the fruit juice overlap the flavor.
5. Sterilization of glass bottle for 350 degrees F for 30 minutes to kill the microorganism present in the bottle to ensure to avoid contamination
6. Weighting all raw material (Passiflora Foetida Linn Syrup, granulated sugar, high fructose corn syrup (HFCS), distilled water) using digital weighing scale.
7. Mixing all the ingredient until it well combine.
8. Pasteurization of Passiflora Foetida Linn Fruit Juice mixture at 150 degrees F for 20 seconds to inactivate enzymes from the fruit, but microorganisms also are inactivated during the pasteurization.
9. Filled the pasteurized Fruit juice in a sterilized glass bottle and cover with lid.
10. Sterilization of finished product in water bath for 15 minutes at 140 degrees F.
11. Cooled, labeled and keep refrigerated for better results.

2. Sensory evaluation

The sensory evaluation of Passiflora Foetida L. was carried out using score card developed by purpose. The scorecard was prepared, and considering the quality characteristics of the Nutri-fruit Drink. The descriptive terms were used for the various quality attribute likes taste, odor, appearance, flavor, acceptance. According to Shiksha (2012), sensory evaluation has been defining a “A Scientific discipline used to evoke, measure, analyzed and interpret reactions to those properties of foods and materials as they are perceived by senses of sight, smell, taste, touch hearing.” Four variables affect sensory evaluation: the food, people and the testing environment and test method used.

The evaluation of Passiflora Foetida Fruit Drink was carried out using a scorecard was prepared and developed for the purpose. The scorecard was prepared, considering the quality characteristics of the product.

RESULTS AND DISCUSSIONS

1. Formulation of Passiflora Foetida Nutri-fruit drink

Simple operation in the formulation of Passiflora Foetida Fruit Drink, where firstly Passiflora Fruit extract was prepared, then mixing with other raw materials, pasteurizing, filling, sterilizing, cooling and packing. Among of the formulated fruit drink, 35 % of Passiflora Foetida Fruit extract were used in trial one, 40% in

formulation two, 45% in formulation three, 55% in formulation four, and 65% in formulation five, respectively. In order to feel the pure and freshness of *Passiflora Foetida* Fruit, fresh and natural were used. Additionally, other ingredients were used as the same amount in all formulated fruit drink with each of the trial purposes.

2. Sensory Evaluation

Table 3 shows the mean sensory score of the develop *Passiflora Foetida* fruit drink. The evaluation was done for taste, color/appearance, odor and over all acceptability. The taste of *Passiflora Foetida* fruit drink from trial 1 to trial 5 was increases the acceptability of the respondents with the 65% percent of extracted syrup. The sensory evaluation on taste, the Trial 5 with 65% percent of extracted syrup was rated by the respondents with the highest average mean of 8.58, like very much. However, the Trial 1 had the lowest average mean of 6.58, like moderately. The overall acceptability of sensory evaluation in taste was 7.65, with the verbal interpretation of like very much. As assesses by the respondents says that increasing the portion of *Passiflora Foetida* Linn extracted syrup may reach the actual and same taste of the fresh fruit.

The Color/ Appearance of *Passiflora Foetida* Fruit Drink was gradually change from light yellow green to yellow green. The color/ appearance of fruit drink was increases the changes by adding the amount of extracted syrup that gives palatable and eye catching color. The sensory evaluation in color/ appearance, the Trial 5 has the highest average mean with 8.63, like extremely it has contained 65 % of extracted syrup from the fruits. While the Treat 1 got the lowest average mean with 7.18, like very much with 35% of extracted syrup. The overall acceptability of color/appearance in the *Passiflora Foetida* Fruit Drink with the average mean of 7.83, with verbal interpretation of like very much. They said that color and appearance in term of beverages is important to be able to attract consumers, and increasing the amount of extracted syrup may improve the color of the developed.

The odor was gradually increase of *Passiflora Foetida* Linn extract by the amount of extracted syrup increase the odor or fragrance will also increase that gives additional quality in the fruit drink. The Trial 5 got the highest average mean of 8.56, like extremely with 65% percent of extracted syrup. While the Trial 1 got the lowest average mean of 7.08, like very much with the 35% of extracted syrup. The overall acceptability of *Passiflora Foetida* Fruit Drink in sensory evaluation of odor was 7.77, with the verbal interpretation of like very much. They said that increasing the extracted syrup was also improved the odor and flavor the developed drinks.

Table 3 Sensory Evaluation of Passiflora Foetida Linn Fruit Drink

Parameter	Sample					Ave.	Verbal Interpretations
	T1	T2	T3	T4	T5		
Taste	6.58	7.41	7.60	8.12	8.58	7.65	Like Very Much
Color/ Appearance	7.18	7.43	7.55	8.37	8.63	7.83	Like Very Much
Odor	7.08	7.35	7.60	8.25	8.56	7.77	Like Very Much
Overall Acceptability	6.94	7.39	7.58	8.24	8.59	7.75	Like Very Much

The overall acceptability of the developed Passiflora Foetida Fruit Drink, as seen in the table 3 the Trial 1 got the average mean of 6.94, like moderately with 35% of Extracted syrup, Trial 2 got the average mean of 7.39 with verbal interpretation of like very much with 40% of extracted syrup, the Trial 3 got the average mean of 7.58, like very much with 45% of extracted syrup, while in Trial 4 got the average mean of 8.24, with verbal interpretation of like extremely with 55% of extracted syrup, the 65% of extracted syrup got the highest average mean of 8.59, like extremely. Trial 5 was the most acceptable for the respondents in assessing the sensory evaluations of three parameters the taste, color/appearance, and odor. After comparing the five trial, the Trial 5 in the most preferable in terms of overall acceptability.

CONCLUSIONS

Based from the findings of the study, the following conclusions were drawn:

1. The process in developing the Passiflora Foetida Fruit Drink was possible through the collaborative efforts of the group including the technical assistance by the laboratory agencies and industry.
2. The raw material used in producing the fruit drink were available from local farm.
3. The 65% of extracted syrup has a stable Passiflora Foetida Linn flavor, odor throughout the period.
4. There is need improvement in the overall acceptability of the samples.

RECOMMENDATIONS

Based from the findings and conclusion of the study, the following recommendation were hereby drawn:

1. Enhancement of the process or procedure in developing Passiflora Foetida Fruit Drink may help to improve the quality and shelf life of the product.
2. Additional additive should be used to retained and improved the nutritional content of the product.
3. Microbiological test and nutritional analysis should be included in the development, to further increase the overall palatability, acceptability and safeness of the Passiflora Foetida Linn Fruit Drink.

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