



JOJAPS

eISSN 2504-8457



Journal Online Jaringan Pengajian Seni Bina (JOJAPS)

Piper Kaduk Sheet

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Abstract

Piper sarmentosum (PS) or Kaduk is plant belongs to the family of Piperaceae, has become popular due to its application in medicinal properties throughout the globe and culinary herbs in Southeast- Asia. The leaves traditionally contain naringenin, a flavanone that considered to have bioactive effects as antioxidant for human health used to cure many diseases such as fever, asthma, toothaches, headaches and coughs as well as contributes in pharmacological effects to relieve hypertension, anti-cancer and anti-diabetes. Despite the health benefits, easy to grow and abundance sources, the production of ready to eat products from PS plants is almost none in the market. Therefore, the objective of this study was undertaken to prepare the functional sheet from Piper leaves produced under the identical conditions of cooking time, temperature and shape. The main focus on this product development is to make it ready to eat and multiuse, hence the Piper Kaduk Sheet was made and shaped in a roasted dried sheet in measured sized approximately 8" x 7" which can be easily consumed for seasoning, soup, rolls and infused for drink.

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Key-word: - *Piper Sarmentosum, Product Development, Sheet*

1. Introduction

Food innovation is the development and commoditization of new food products, processes, and services. Nowadays the new product development it's happening rapidly to meet the market demand. Food and beverage companies are looking for ways to make healthy, nutritious offerings and multi-use products that are not only tempting, accessible, exciting, and unique, but also sustainable. Previous research shown the product development process has been described as a five to eight-step process including idea or concept generation and screening, research, development and product testing and marketing launch activities (Rudder, Ainsworth, & Holgate, 2001; Stewart-Know & Mitchell, 2003). Therefore, sustaining the new product development using the Kaduk leaf is a main focus of this research. History said preserving food in sealed container was found in 1809 was using as food supply for the British Army and Royal Navy, since then Multi-purpose food was introduced in 1940s as remedy for widespread hunger in postwar Europe. Multipurpose food (MPF) a low cost, shelf –stable and nutrient rich food supplement manufactured to be consumed in case of emergency or disaster (n.d.2017).

Malaysia is a developing country where technology is available throughout the country. Hence, the advance in understanding the accessibility between nutritional and functional foods that resulted in the new development of food products. The food product diversity that available in the market nowadays will lead to the to the convenience of obtaining the food even the sources is in limitation. As knowing the fresh leaves or green vegetables is perishable items that have a due date to be in the shelves, but the food product research and development somehow neglecting this idea where there have almost none fresh leaf-based product availability in the market especially in Malaysia. Accordingly, the general focus of this study is to involve in new product development based on Piper sarmentosum (PS) or *kaduk* leaf and the objective of this study are to produce ready to eat and multiuse sheet of *kaduk* leaf, to obtain the best formulation of producing the sheet and to study the acceptance towards PS leaf-based product.

2.0 Problem Statement

The biggest problem faced by small medium entrepreneurs (SME) in Malaysia is constraint of fresh leaf to fulfil market demand. Through highly request especially in food production of traditional cuisine in Malay, Thai and Baba and Nyonya cuisine, some entrepreneur will optimism there have a good solution or substitute product to overcome the difficulty. (Siti Ruby, 2020) Food pattern consumption among Malaysian nowadays show that reception of food cuisine besides Malay cookery indicate the improvement. Thus, food development of the based on piper sarmentosum (PS) leaf product is believed to some extent would be a new addition in the market.

3.0 Literature Review

Piper Sarmentosum (PS) is an herbaceous plant that belongs to the family of Piperaceae. (Ismail et al., 2018) and the mature leaves are alternate and heart shaped while the young leaves have waxy surface and the color slightly light green. PS also known as *Kaduk* leaf in Malaysia have a very aromatic and strong smell (Maizatul and Nafisah, 2019). Piper sarmentosum is easy to grow. It is propagated through vegetative cuttings where it spreads from the fragments and rhizomes that have a root and sprout at each node and the discarded cuttings are quick to develop roots. The plant grows in a humid, warm spot in the shade, and grows well in rich and damp soil in secondary forest, near sea level at 1000m and requires good drainage. Piper Sarmentosum (Ismail et al., 2018). PS has been widely used as both cuisine and traditional remedy. (Mazura et al., 2013). The previous research has revealed the scientific evidence that supports various traditional claims, and safety as a food. (Khalid et al., 2012)

3.1 Culinary Purpose

Khalid (2012) and Mazura et al (2013) revealed that Piper Sarmentosum has been widely used in cuisine and safe for consumption. Piper sarmentosum leaves are sold in bunches and are usually eaten raw. In Thai cuisine, the fresh leaves are used to wrap *miang kham*, a traditional cuisine and also used in curry of Northern Thailand cooking. The leaves are often confused with betel leaves; which are a smaller shape and lack of intense smell that have been used in Asian especially in Southeast Asian used as wrap for the chewing for areca nut or tobacco. In Malaysia, Kaduk leaf is used as one of the traditional ingredients especially in Baba and Nyonya cuisine.

3.2 Alternative Medicines

Piper sarmentosum is popular due to its culinary and medicinal properties. Piper sarmentosum has been used traditionally in different parts of the world to cure many diseases and ailments (Mitra, et al, 2007). Patents and commercial product by Lu, (1995) about the aerial parts of the plant in a proportion of 19.05% with some other herbs and gypsum are used to prepare an external adhesive plaster that has been proved to be efficacious and nontoxic and Zihua, (2006) liquor made from certain herbs including PS is being recommended for rheumatoid arthritis, arthralgia, rheumatic numbness, rheumatism and traumatic injury. The plant contains constituents like alkaloids (amide, pyrones, flavonoids), as reported by Tuntiwachwuttikul et al. (2006). It has also been reported to possess pharmacological properties like anti-cancer (Zainal, et al, 2009), hypoglycemic (Peungvicha, et al, 1998), anti-tuberculosis (Hussain, et al, 2008), antioxidant (Subramaniam, et al, 2003) and antimalarial (Najib, et al, 1999). A result from a study by Qin et al, (2010) also provided experimental evidence for the application of P. sarmentosum in botanical pesticides. Due to all these properties, the plant has great potential to be commercialized as a medicinal plant in South-East Asia, particularly Malaysia.

4.0 Materials and Method

Piper Sarmentosum (PS) leaves, jelly powder, salt and water are the main ingredients in making piper kaduk sheets. The raw ingredients were purchased at local market area Pasir Gudang, Johor. Washed the PS leaves and measure all the ingredients for best formulation. Follow all the steps; cooked/boiled, blended, shaped, baked and packed by looked at the temperatures and preparation times to get best results of the product. The sensory evaluation results of the product was accepted by the panelists using nine-point Hedonic scale. Consumer acceptability scores on a 9-point hedonic scale (Scale: 1-dislike extremely; 2-dislike very much; 3-dislike moderately; 4-dislike slightly; 5-neither like or dislike; 6-like slightly; 7-like moderately; 8-like very much; 9-like extremely). Each scale is used to complement the other in the measurement of food acceptance and the scale has proven itself to be a simple and effective measuring instrument. Hence, the scale may be effectively truncated to seven, so that the scale loses its usefulness for measuring certain degrees of food acceptability. The quality of the finished product was analyzed.

4.1 Product Developments



Figure 1: Ingredients for Piper Kaduk Sheet

PS leaves were washed and boiled in a pot with water, jelly powder and salt. Then blend all the cooked ingredients into a food processor until fine in texture. Scraped and shaped 100 gm of paste on a silicon mat approximately into rectangular shape 8'' x 7'' for each sheet. The scraped mixture then baked in the oven for 30 minutes at 120°C. Let the sheets dry before keeping them in the air tight container. Repeat with remaining paste. Final product can be used as wrap/rolls, seasoning, infused for drink and snack.



Figure 2: Process for developing Piper Kaduk Sheet



Figure 3: Piper Kaduk Multiuse Sheet (wrap/rolls, seasoning, infused for drink and snack)

5.0 Result and Discussion

5.1 Formulations for Piper Kaduk Sheet

Table 1: Best Formulation of Piper Kaduk Sheet

Ingredients	Formula
Piper Sarmentosum/Kaduk Leaves	27.4%
Water	72%
Jelly Powder	0.3%
Salt	0.3%
Total	100%

5.2 Sensory Properties of Piper Kaduk Sheet

5.2.1 Demographic Analysis

Table 2: Demographics profile of respondent ($\pi=40$)

Demographic Variable	Details	Frequency	Percentage (%)
Gender	Male	6	15
	Female	34	85
Age	20 to 29	1	2.5
	30 to 39	19	47.5
	40 to 49	20	50

5.2.2 Data analysis for Sensory Evaluation using 9-point Hedonic Scale

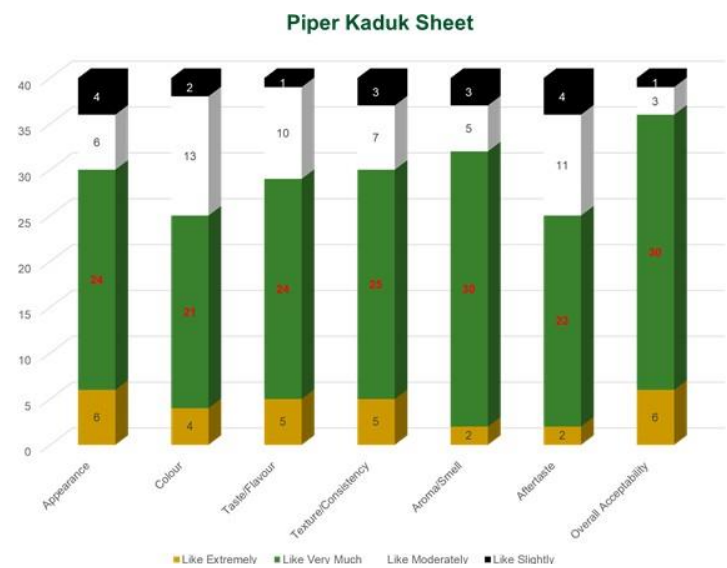


Figure 1: Data analysis for Sensory Evaluation using 9-point Hedonic Scale

Table 3: Panellists Description of Piper Kaduk Sheet

No	Sensory Evaluation	Panellists	Description($n=40$)
1	Appearance	24	Like very much of the appearance as the eye and mind agreed with the product
2	Colour	21	Like very much the colour because the colour not too dark or pale
3	Taste/Flavour	24	Like very much the taste/flavour combination of fresh, salty, bitter and peppery
4	Texture/Consistency	25	Like very much the texture/consistency as they touch and bite
5	Aroma/Smell	30	Like very much the aroma/smell of the product because the refreshing element
6	Aftertaste	23	Like very much the aftertaste because it is palatable, edible and pleasant
7	Overall Acceptability	30	Like very much the overall acceptability and satisfactory with the product

6.0 Conclusion

Piper Kaduk Sheet is antioxidant food product that can be safely consume by the community. Therefore, this product was made without adding any coloring or preservative. It could be beneficial for human health. The sensory results show 50% of the panelist like very much of the product. Piper Kaduk Sheets can be consuming as snacks, wrap, seasoning and infused in drink as antioxidant tea. With the multiuse function, it will diversify the food option in the food market industry and increase the economic value. This Food innovation have good potential in terms of commercial value because the production cost is low. As in the agricultural industry, it will maximize the usage of the herbal leaves.

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