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Effect of Adding Fiber from SeraiKayu (*Eugenia Polyantha*) Waste on Organoleptic Characteristic and Sensory Evaluation of Cracker

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Abstract: The effect of adding fiber from SeraiKayu (Eugenia polyantha) waste in cracker was studied on organoleptic characteristic and sensory evaluation of cracker. Cracker prepared from SeraiKayu (Eugenia polyantha) waste containing different proportion of waste (2%, 4% and 6%) from two sources of waste, boiling and extraction of SeraiKayu (Eugenia polyantha) leaves. The crackers were evaluated for organoleptic characteristics and sensory evaluation. Statistical analysis revealed no significant differences ($P < 0.05$) among formulations of the crackers for colour, firmness, saltiness and crunchiness characteristics. Meanwhile, the bitterness and aroma characteristics of the crackers were affected significantly with increasing levels of SeraiKayu (Eugenia polyantha) waste in crackers. In general, the crackers were accepted by the panelist during the sensory evaluation test and has potential as new source of fiber for use in high fiber products.

Key words: Seraikayu, cracker, fiber

1. Introduction

Cracker is a baked product typically made from a grain and flour, form doughand usually manufactured in large quantities. Crackers are usually flat, crisp, small in size (usually 3inches or less in diameter) and made in various shapes, commonly round or square. Generally the term crackers covers wide range of products similar to semi sweet machine cut cookies to fermented, crisp, non-sweet and laminated items. The crackers are similar to the chemically leavened products, include the categories of the semi-sweet gram crackers and the highly flavoured snack crackers with predominant onion, garlic, caraway, smoked yeast and cheese flavours. Among the fermented types of crackers, the soda or salty crackers are the most common.

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Eugenia polyantha is known as SeraiKayu among the locals comes from family of *Mythaceae*. It distributes in lowland forest like in Burma and Malaysia (Pulau Langkawi) and Singapore. *Eugenia polyantha* leaves grows wildly in the western part of Peninsular Malaysia and in western Indonesia. The leaves are slightly astringent or sour and the flavour develops more after frying. It has long been used as spices in cooking [1]. It also has medicinal uses. The roots and fruits extract have ability to neutralize overdoses of alcohol consumption. Extract of the leafis used to stop diarrhea, gastritis, diabetes mellitus, itchy, astringent and scabies. It side effects are lower compared to synthetic drugs. The main chemical constituents of this plant are euginol, citral, tannins, flavonoids and metachavicol.

Demand for health oriented products such as sugar-free, low calorie and high fibre products is increasing. One such recent trend is to increase the fibre content in food products to overcome health

problems such as hypertension, diabetes, and colon cancer, among others. Fibre sources from wheat, rice, oat and barley were used to study their influence on rheological characteristics of wheat flour dough and biscuit making quality. The aim of this study is to determine the acceptability of crackers added with fiber from SeraiKayu *(Eugenia polyantha)* waste and its organoleptic characteristics.

2. Literature Review

2.1 Taxonomy and Characteristic ofSeraiKayu

Scientifically, Seraikayu is named *Eugenia polyantha Wight* and the synonyms are *Eugenia lucidulamiq*and*Syzyqium polyantha Wight*. The taxonomical chart put this plant in the Spermatophyte division, Pinophyta sub-division, Coniferopsida class, Eugenia family, Miracles genus, and Eugenia polyanthum (Wight) walp species. In some region or provinces in Indonesia, bay leaf is known as meselangan (Sumatra), ubarserai (Malay), Salam (Java, Sunda, Madura), gowok (Sunda), manting (Java) or kastolam (Kangean)

SeraiKayu is a tall tree, evergreen and it grows up to 30 feet. First, he grew up in a state of white flowers, star-shaped yellow or greenish in the group during the early spring. Then it produces a dark green color to purple. The leaves are thick, strict with oval, glossy, dark green leaves and it is measured with about 3-4 inches long. SeraiKayu can also produce pleasant aroma and sweet when added into any recipes. Dry and withered leaf can be stored for several months. In addition, it has a fruit like (berries) can also be used as a flavoring agent in cooking [2].

Most people are familiar with the seraikayu as a culinary herb used to season soups and stews, but it also has a centuries-old reputation as a medicinal herb. The seraikayu effectiveness in treating many of the conditions it was originally used to treat has not yet been proved, but modern science has found two surprising applications that may have a place in modern medicine.SeraiKayu have been used medicinally for centuries. They were eaten fresh or dried and infused into warm water to be taken internally for a variety of ailments. The resulting infusion was a diuretic, increasing urination to remove excess water from the body, and an emetic, to induce vomiting. Seraikayu also have astringent properties, which could help stop secretions due to infection and help reduce excessive sweating brought on by illness. None of these traditional uses have been backed up by modern science, but current technology has allowed for deeper investigation that has revealed startling results.

2.2 Ingredient in Cracker Processing

According Sudha et al. (2007) [3], wheat flour is divided into three types based on protein content, namely wheat flour with a high protein content (Hard Flour). This flour has a protein content between 12%-14% which is very good for making bread and anika suitable for making noodles because it has physical properties that are elastic and strong elasticity so that the noodles are not easy broken. Wheat flour with protein content of the medium (Medium Flour). This flour is usually called as flour versatile because it has a protein content between 10%-11.5%, which is suitable for making cakes, noodles, pastry, and bahulu. Low protein wheat flour containing protein 8%-9.5% increase resilience but cannot increase that fragility suitable for making cookies, wafers, and sponge cake.

Butter is generally made from animal fat. This is the kind of food that is emulsifying the water phase in the oil phase (water in oil). Water and oil is a liquid that does not smack each other because they have different specific gravity. In order to maintain the oil droplets in the water neatly arranged in butter requires an emulsifier or emulsifier [4]. The emulsion of butter is 18% water mixture consisting of 80% fat, with a small amount of protein that acts as an emulsifier. Butter is made from milk fat (especially fat cow's milk) is sweet or sour. Fat milk is left to sour spontaneously or through the addition of bacterial inocullum (fermentation). In the diet, butter is a source of high

(bio calories kilo calories value of about 9 kilo calories per gram. It is also a source of unsaturated fatty acids, namely oleic and linoleic. In addition, butter is also a source of vitamins that dissolve in the oil vitamin A, D, E, and K [3]. Butter used in making bread to make bread soft and smooth to add bond structure in the dough. In addition, nourish and give color.

3. Materials and Methods

3.1 Sources of Eugenia Polyantha Waste

SeraiKayu (*Eugenia polyantha*) Waste was taken from the residue of Boiling Method and Extraction Method (Water Extraction). The residues were drying in 40-60°C temperature for 8 hours.

3.2 Preparation of Cracker

The crackers were prepared using standard formulation for cracker. Preparation of crackers was carried out using low protein flour, added with 1%, 2% and 3% of *Eugenia polyantha* waste from Boiling and Extraction Method.

3.3 Evaluation of Crackers

3.3.1 Moisture Content and Crude Fiber Determination

Moisture content and crude fiber content in crackers were determined according to the method described in AOAC.

3.3.2 Sensory Evaluation

The sensory evaluation test was evaluated by 40 panelists from Food Technology Department. The panelists were asked to evaluate the taste, colour, aroma and overall acceptance of the crackers using 7 points Hedonic Scale Test ranging from like extremely (1) to dislike extremely (7) for each organoleptic characteristics. The organoleptic characteristics of the crackers were evaluated using Scoring Test for colour, firmness, saltiness, bitterness, crunchiness and aroma.

3.3.3 Statistical Analysis

All data were expressed as mean values ± standard deviation. Statistical analysis was performed using one way analysis of variance (ANOVA) followed by Duncan's Multiple Range Test with $p < 0.05$ being considered statistically significant. Statistical analysis was conducted with SPSS program Version 17.0.

4. Results and Discussion

Results for moisture content and crude fiber content in crackers added with fiber from SeraiKayu (*Eugenia polyantha*) waste are shown in Table 1 and Table 2. The results showed that moisture content for the formulation from Extraction Method is lower than the formulation from Boiling Method. It may be because of Extraction Method is a long time process compared to the Boiling Method with a higher water absorption during the process. However, the moisture content in all the formulation in both methods are still in the range of standard moisture content for crackers. The crude fiber content in crackers showed that the percentage of crude fiber content in crackers added with fiber from SeraiKayu (*Eugenia polyantha*) waste from extraction method is higher than the waste from boiling method. It may also because the Extraction Method is a long time process that can shred the leaves into smaller pieces.

Results of organoleptic characteristics for the crackers added with Fiber from SeraiKayu (*Eugenia polyantha*) Waste are shown in Table 3. Added fiber from *SeraiKayu* (*Eugenia polyantha*) resulted in considerable changes in the sensory properties of

Table 1 Percentage of moisture content in crackers added with fiber from SeraiKayu (*Eugenia polyantha*) waste.

Method / Formulation	Boiling (%)	Extraction (%)
F1 (2%)	1.62%	2.72%
F2 (4%)	1.4%	2.54%
F3 (6%)	1.2%	2.32%

Table 2 Percentage of crude fiber content in crackers added with fiber from *SeraiKayu* (*Eugenia polyantha*) waste.

Method / Formulation	Boiling (%)	Extraction (%)
F1 (2%)	7.10	14.15
F2 (4%)	8.45	18.15
F3 (6%)	8.80	18.60

Table 3 Mean values for scoring test of crackers added with fiber from *SeraiKayu* (*Eugenia polyantha*) waste.

Attributes / Formulation	Colour	Firmness	Saltiness	Bitterness	Crunchiness	Aroma
F1 (Boiling)	4.47±0.629(a)	3.87±0.681(a)	3.90±0.759(a)	2.83±0.791(a)	2.20±0.887(a)	2.60±0.675(a)
F1 (Extraction)	4.70±0.837(a)	3.20±0.610(a)	3.63±0.718(a)	2.63±0.809(a)	2.50±0.938(a)	3.10±0.712(a)
F2 (Boiling)	4.00±0.910(a)	4.13±0.629(a)	3.93±0.521(a)	3.83±0.699(a)	3.57±0.898(a)	3.47±0.571(a)
F2 (Extraction)	4.63±0.809(a)	4.37±0.809(a)	3.83±0.531(a)	3.10±0.607(b)	4.17±1.177(a)	3.80±0.610(b)
F3 (Boiling)	5.90±0.803(a)	3.40±0.814(a)	3.10±0.481(a)	6.37±0.615(b)	4.87±1.224(a)	5.83±0.531(b)
F3 (Extraction)	6.20±0.847(a)	3.27±1.3888(a)	3.00±0.525(a)	6.64±1.527(b)	4.87±1.252(a)	6.27±0.740(b)

crackers. Colour, firmness, saltiness and crunchiness, the most important sensory attribute of crackers, are not significantly different ($p > 0.05$) among formulations. For the bitterness and aroma characteristics, data showed that there are significance differences ($p > 0.05$) among formulations according to the percentage of fiber added into the crackers. The data showed that the higher percentage of the fiber added will increase the bitterness and aroma of the crackers.

Colour, texture, aroma and overall acceptance characteristic of the crackers were not affected by adding of fiber from *SeraiKayu* (*Eugenia polyantha*) waste.This was proven by the data showed that there are no significance differences ($p > 0.05$) among all formulations. For the taste characteristic, data showed that there are significance differences ($p > 0.05$) among 3 formulations according to the percentage of fiber added into the crackers, but there are no significance differences ($p > 0.05$) according to the sources of the fiber. It may due to the higher percentage of the fiber will increase the bitterness of the crackers. Overall acceptance showed that the best formulation preferred by the panelists are Formulation 2 (F2) from both Boiling and Extraction Method.

5. Conclusion

It may be concluded from the research that a few organoleptic characteristics of crackers were affected significantly with increasing levels of SeraiKayu (*Eugenia polyantha*) waste in crackers. In general, the crackers were accepted by the panelist during the sensory evaluation test and has potential as a new source of fiber for use in high fiber products.

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