The Quality of Salacca Tree Midrib Latex Flour as a Thickening Agent

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Abstract. The use of food ingredients to various processed products of livestock, agriculture, and fisheries requires a thickening agent to improve its quality. Salacca trees are found around the South Tapanuli Region. So there will be a study of its potential as a thickening agent. This research was conducted in April - June 2019 in South Tapanuli. The purpose of this study was to determine the quality of salacca tree midrib flour as a food thickening agent. This research shows that salacca tree latex flour has a fairly good quality and has the potential to be used as a food thickening agent.

1. Introduction

In processing various types of food, whether it comes from livestock, agriculture, or fishery products, often require additive ingredients to increase the suppleness of the product to be made. Many additive ingredients can be found in the market. But most of these ingredients are no longer recommended because their use can interfere with consumer health.

Nowadays, in the culinary industry, it is recommended to use natural ingredients. Aside from the demands on businesses to maintain food safety, it is also the need of consumers to enjoy healthy and healthy food. South Tapanuli is part of the region in North Sumatra Province and consists of five regencies/ cities, namely: South Tapanuli Regency, Mandailing Natal Regency, Padang Lawas Regency, North Padanglawas Regency, and Padangsidempuan City. Geographically, the Southern Tapanuli region is in the Western Hemisphere of Indonesia and in the South of Sumatra Island, which is located at 0.02 'to 2.3' degrees North Latitude and 98.49 'to 100.22' degrees East Longitude[1]

South Tapanuli has long been known for its rich natural resources. One of them is salacca agriculture/plantation. Salak production is abundant in Padangsisimpuan, and this causes the city to get the nickname as Salak City. The existence of salak in South Tapanuli is still widespread. Generally, there are five districts, namely West Angkola District, South Angkola District, Marancar District, Padangsidempuan Hutaimbaru District, and Padangsidempuan Angkola Julu District.

Salak (*Salacca edulis*) is a native fruit plant from Indonesia. This fruit thrives in the tropics. This plant belongs to the family Palmae, which is thought to be from Java. It turns out that not only in Indonesia, salak can also grow and spread in Malaysia, the Philippines, Brunei, and Thailand. Salak is a tropical fruit native to Indonesia. In Indonesia, there are approximately 13 species (species) of salacca and their relatives because our country is the center of origin of salacca plants. Based on the type of flowering, salacca plants are divided into three types, namely plants with male, female, and perfect flowers. Male plants only produce male flowers, female plants only produce female flowers, and perfect plants can produce male and female flowers, Budiyanti said in[2]

Besides producing fruit, this plant also produces a lot of sap. This fact is known at the time of farmers do pruning midribs. Midribs which is cut instantly produced a lot of clear and chewy sap. Physically, this sap looks like a springy glue.

Based on the explanation above, it is necessary to study the potential of the salak tree sap to become a sponge. Thus, the need for the production of processed foods that are safe and healthy can be met by using natural ingredients that are around us.

2. Research methods

Field and laboratory experimental methods for salak tree frond samples. Testing in the laboratory by analyzing the content of materials in the form of water content, ash, protein, crude fiber, fat by the [3] procedure method. And carbohydrate analysis using the by the different method by Winarno in[4]. Besides, the Vitamin C test was carried out with the iodimetry and carrageenan method (gravimetric test) on fresh sap samples and latex samples. The results of the sap analysis will be compared with the results of the analysis of other fillers (carrageenan and flour).

The work steps in making the sample of the salacca tree sap test are as follows: salak tree sap is taken by cutting the stem of the stem. Salacca sap is collected in a container after it comes out from the midrib. The weight of the resulting sap is calculated to find out the amount of potential sap. Then, the sap obtained is laboratory tested.

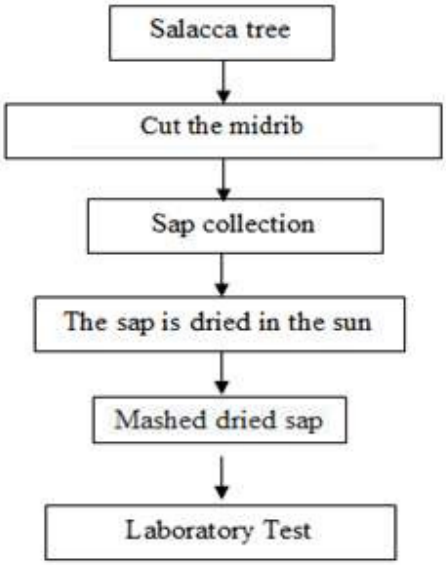

Figure 1. Research flow chart

3. Results and discussion

3.1. Potential of Salak Tree Sap Salak

Based on the survey results, it is known that farmers in South Tapanuli routinely clean their gardens. Cleaning the garden will always do the cutting part of the bark of the bark. The resulting sap was very much and not utilized. that the number of salak plants spread in North Sumatra Province is 7,149,052 stems/trees. South Tapanuli as salak-producing centers in North Sumatra Province with a presentation of 89.9% or equivalent to 6,426,998 stems/trees[5].

A random survey of salacca farmers spread across South Tapanuli (data attached) shows that, on average salacca farmers do garden cleaning one time every month. Every cleaning will cut as much as three stems. Each stem which is cut produces 100-200 grams of sap. This means that each plant produces about 300-600 grams/month. Following is the presentation of the salak tree sap potential in Southern Tapanuli.

Table 1 Presentation of the salak tree sap potential

No	Potential Observation	Number of stems / trees	Sap Potention (kg)	
			0,3	0,6
1.	Sap Potention in Noth Sumatera	7.149.052*	2144715,6	4.289.431,2
2.	Sap Potention in South Tapanuli	6.426.998*	1928099,3	3.856.198,8

* [5]

Based on the table above, it is known that the potential for fresh sap is very abundant. Sap production for South Tapanuli it reached 1928099.3-3856198.8 kg.

3.2. Salak Tree Sap Flour

Based on the research, a process of flouring of salak midrib is carried out and the yield is around 10%. The following table is the potential of salak tree sap flour in South Tapanuli :

Table 2 Potential of salak tree sap flour

No	Potential Observation	Sap Potention (kg)		Rendemen 10%
		0,3	0,6	
1.	Sap Potention in Noth Sumatera	2144715,6	4.289.431,2	214471,6– 428.943,1 kg
2.	Sap Potention in South Tapanuli	1928099,3	3.856.198,8	192809,9– 385.619,9 kg

Thus based on yield, this flour is known to have potential in South Tapanuli as many as 192809.9-385,619.9 kg. Testing of the sample is carried out to find out the quality. Tests carried out include water content, ash content, protein, fat, crude fiber, carbohydrates, vitamin C and gel strength. The following table shows the results of the salacca plant sap content test.

Table 3 Results of the salacca plant sap content test

No.	Testing	Test Results	Information
1.	Water Content	9,2358	%
2.	Ash	26,9914	%
3.	Protein	7,2983	%
4.	Crude Fiber	6,2058	%
5.	Fat	1,0232	%
6.	Carbohydrate	16,0997	%
7.	Carragenan	4,2769	cp
8.	Gel Strength	177,45	gr/cm^2

Based on the data above, the quality of salak midrib latex flour is quite good. Moisture content produced from salak tree sap flour is about 9.2385%. This value has fulfilled the requirements set by FAO [6], stating the maximum carrageenan type water content is 12%. Things that affect the value of the moisture content of the material can be influenced by the drying method used and the time of drying.

The value of ash measured from food shows the amount of mineral content in it. The results of the test showed that the salak sap contained ash as much as 26.9914%. Compared to FAO[6] and FCC[7] standards for carrageenan types, the values obtained have met FAO and FCC standards. FAO[6] determined that carrageenan type ash content ranged between 15-40%. Meanwhile, according to the FCC [7], a maximum of 35%.

The protein content obtained from the salak tree sap flour is known to be 7.2983%. This value is not too far compared to other food fillers, such as wheat flour. Where according to the USDA[8] states that the protein content of wheat flour as much as 9.61%. Furthermore, tapioca flour filler is only 0.19%.

The fat contained in salak tree sap flour is 1.0232%. This value is lower when compared to the fat content of food ingredients in flour, according to the USDA[8] that the wheat fat content is 1.95%. Furthermore, for tapioca flour fillers only 0.02%.

The carrageenan value of salacca tree sap is 4.2769 cp. This value is following the value of the viscosity of the skin of the cone gelatin, ranging between 3.34-4.35 cp[9]. Added by Peranginangin et al in [9] are still included in the standard food gelatin specifications, which range from 2.5 to 4.5 cp.

The strength of the gel is a maximum load needed to solve the polymer matrix in the area of burden[10]. The more weight is needed, the higher the gel strength will be. The ability to form a gel is one of the carrageenan properties that is the basis of its use in various industries. The results showed a gel strength value of 177.45 gr / cm^2. Compared to the opinion of Bunga[11], that the strength of carrageenan gel *Eucheuma cottonii* is expressed between 34.95 g / cm^2 to 78.505 g / cm^2.

4. Conclusions

Based on the results of tests on salak tree sap flour has a fairly good quality and has the potential to be used as a food thickening agent.

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