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Nutritional Value Content in Mangrove Syrup From *Sonneratia alba* Fruit

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Abstract

Pedada fruit (*Sonneratia alba*) is a fruit of mangrove plants whose utilization can be improved through simple technology, namely the processing of *Sonneratia alba* fruit into syrup. Mangrove plants produce fruit that can be utilized as a processed beverage, one of which is *Sonneratia alba* fruit that has a sour taste and can be processed into fresh drinks in the form of mangrove syrup. The purpose of the study was to find out the nutritional value content of mangrove syrup from *Sonneratia alba* fruit. Research methods are experiments. We use proximal analysis, which includes tests on protein, fat, carbohydrate, and vitamin C. Proximal analysis is carried out at the organic chemistry laboratory, Faculty of MIPA Universitas Jenderal Soedirman. The results of our research show Processed mangrove syrup from *Sonneratia alba* fruit has nutritional content: protein 1.20%, fat 0.20%, carbohydrates 3.50%, and vitamin C 55.30%. Mangrove fruit from *Sonneratia alba* processed into syrup has a high nutritional and antioxidant value and is rich in fibre, which is good for health

Keywords: Mangrove; *Sonneratia alba*; Syrup; Nutrient.

Introduction

Mangroves are plants that have many benefits and typical plants that grow in coastal areas. Mangroves produce fruit that can be processed into a variety of foods and drinks. A'in *et al.* (2017) state that processed mangrove fruit into food products can be economically beneficial. In general, mangroves benefit from reducing environmental degradation. Ecologically mangroves have a variety of benefits, among others as a habitat for fish seeds and a place to eat shellfish and crabs (Wintah *et al.*, 2018a). Mangroves are also helpful for maintaining climate stability (Wintah *et al*., 2018c) and maintaining environmental balance (Wintah *et al*., 2018d). Physical-chemical factors of the environment also affect the presence of mangroves (Wintah *et al*., 2021).

The existence of mangroves can be determined from their type that has a distinctive adaptation. The *Sonneratia alba* species have adaptations to high salinity and are often found in areas directly facing the open ocean but not exposed to waves now. Mangrove type *Sonneratia alba*, often referred to as pedada fruit, is a round fruit somewhat scab. The end of the fruit is steamed and wrapped in flower petals (Wintah *et al*., 2018b). *Sonneratia alba* is known by the local names *pedada, bogem, pupat, beropat, mange-mange, susup,* and *wahat white*. *Sonneratia alba* and Sonneratia caseolaris have almost the same fruit shape but are different in the fruit pentilnya. *The pentil* fruit *Sonneratia alba* side in the petals is red. Mangrove fruit is widely developed into processed raw material products such as pudding, *dodol*, brownies, sponges, crackers, sticks, and jams. The development of mangrove fruit into processed food needs more widespread socialization so that mangrove fruit can be utilized to the maximum. In addition to the socialization of the benefits of mangrove, fruit needs to pay attention to the nutritional content of mangrove fruit processed products. There needs to be a healthy content test on various kinds of processed mangrove fruit.

The nutritional content of each food product needs to be included to inform consumers that the meal and safe consumption also contain nutrients needed by the human body. Mangrove fruit is very diverse there that can be processed into foodstuffs and some that cannot be processed into foods. Sonneratia fruit is one of the mangrove fruits that can be processed into foods. Non-toxic Sonneratia fruit has a sour taste, and fruit that has been cooked when peeled will have a soft texture (Apriliani, 2015). In addition to being valid for processed food and beverages, Mangrove fruit is also helpful as medicines and cosmetics (Satoto and Sudaryanto, 2020). Sonneratia caseolaris fruit, in addition to being used as a processed ingredient of fruit syrup, can also be processed into jenang and jam (Rajis *et al*., 2017). *Sonneratia alba* fruit that has been cooked will give off the distinctive aroma of *Sonneratia alba*

fruit. The taste of the fruit is slightly sweet and sour, so it is suitable for syrup processed ingredients.

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Methods

This research is experimental. Tools used in the manufacture of mangrove syrup are scales, measuring cups, knives, basins, blenders, cloth filters, pans, stoves, and stirrers. The ingredients used are Sonneratia alba fruit, water, and sugar. The process of making syrup is as follows; Sonneratia alba fruit that has been cooked is washed, peeled, and in a blender with a composition of 1 kg of Sonneratia alba fruit and 2 litres of water. The fruit that has been blended is squeezed with a cloth sieve until separated between sonneratia alba cider and sonneratia alba fruit pulp. Sonneratia alba cider is put in a saucepan of added 2 kg of sugar and heated on the stove, stirred until it boils and thickens. Once cool, the syrup is ready to be packed into a bottle. To find out the nutritional content of mangrove syrup, there needs to be a proximate analysis. Nutritional value content uses proximal analysis, which includes tests on protein, fat, carbohydrate, and vitamin C. Proximal analysis is carried out at the organic chemistry laboratory, Faculty of MIPA Universitas Jenderal Soedirman.

Results

The nutritional value content of a processed beverage ingredient is an essential parameter for human needs to choose the drink to be consumed. To determine the nutritional value of mangrove syrup from Sonneratia alba fruit, necessary parameters need to be done through comparative testing. Proximal tests include; protein, vitamin C, fat, and carbohydrates are presented in Table 1.

Table 1. Nutritional value of *Sonneratia alba* mangrove syrup /100 g

No	Nutritional Value	Result (%)
1	Protein	1,20
2	Fat	0,20
3	Carbohydrates	3,50
4	Vitamin C	55,30

(Summary Data, 2021)

The nutritional content of mangrove syrup from Sonneratia caseolaris fruit has been tested by (Satoto and Sudaryanto, 2020) through proxy tests, including; protein, vitamin C, fat, and carbohydrates are served in Table 2.

Table 2. Nutritional value of *Sonneratia caseolaris* mangrove syrup /100 g

No	Nutritional	Value (%)
1	Protein	1,24
2	Fat	0,24
3	Carbohydrates	1,74
4	Vitamin C	70,6

(Summary Data, 2021)

Discussion

Protein is one of the substances needed for the human body. Protein is helpful as a building and building substance and fuel in the body (Winarno, 2008). The results of the protein content test contained in the mangrove syrup of *Sonneratia alba* / 100g fruit by 1.20%. This result is lower than the results of Satoto *et al*. (2020) research, namely the protein content in sonneratia caseolaris fruit mangrove syrup of 1.24%. Low protein value in mangrove syrup *Sonneratia alba* fruit due to the processing process. However, the protein content in *Sonneratia alba* fruit syrup is not much different from the protein content of fresh fruit before there is a processing process. This is following the statement (Senior *et al*., 2013) that the protein content in Sonneratia alba fruit syrup has a difference in value less than the protein content of fresh fruit Sonneratia Caseolaris 1.22%.

Fat is a chemical compound consisting of elements oxygen, carbon, and hydrogen. Fat can store reserve energy in the body (Almatsier, 2004). The results of the fat content test in *Sonneratia alba* fruit syrup by 0.20%. Satoto *et al*. (2020) stated that the fat content in Sonneratia Caseolaris fruit syrup is 0.24%. The fat content in *Sonneratia alba* fruit syrup is less than the fat content in Sonneratia Caseolaris fruit syrup. The fat content of *Sonneratia alba* fruit syrup is still safe for consumption. This follows Satuhu (2004) opinion that fruit with a fat content greater than 0.1% is suitable for processing food products.

Carbohydrates are essential nutrients for the body in addition to protein nutrients. One of the benefits of carbohydrates is to control cholesterol levels in the body. Carbohydrates are divided into two, complex and simple carbohydrates. Complex carbohydrates can come from foods that contain whole grains. Simple carbohydrates can come from sugar—Carbohydrate test results on *Sonneratia alba* fruit syrup by 3.50%. Satoto *et al*.(2020) study result in the carbohydrate content in mangrove syrup from Sonneratia Caseolaris fruit by 1.74%.

Carbohydrates in *Sonneratia alba* fruit syrup are higher than mangrove syrup from onneratia Caseolaris fruit. This is due to differences in ripeness in the fruit. This follows sumardjo's opinion (2009), which states that plants in the same variety vary in nutrient count depending on physiological age, agronomic conditions, and environment. The addition of sugar also influences the high carbohydrate in mangrove syrup from Sonneratia alba fruit because sugar is a simple carbohydrate. This is according to Batista et al. (2011), sugar is part of carbohydrates. Fructose, glucose, sucrose, and raffinose are among the compounds from sugars.

Vitamin C is essential for the human body because vitamin C can increase the endurance of the human body. In addition, vitamin C contains high antioxidants. Massot *et al*. (2010) state that vitamin C plays an essential role in preventing scurvy disease, which causes paleness, fatigue, and gum bleeding. The test of vitamin C content in mangrove syrup from *Sonneratia alba* fruit amounted to 55.30%. Satoto research results (2020) the vitamin C mangrove syrup content from Sonneratia Caseolaris fruit by 70.6%. The content of vitamin C in mangrove syrup from *Sonneratia alba* fruit is lower because it is influenced by processing the fruit into syrup. This is following the statement Putri *et al*. (2015). Fruits containing vitamin C will experience a decrease in vitamin C levels if they experience the process of slicing and washing, and boiling because Vitamin C has easily soluble properties in water. If heated for too long, Vitamin C contained in the fruit will be damaged due to the oxidation process by the outside air.

Conclusion

Pedada fruit (*Sonneratia alba*) is a fruit of mangrove plants whose utilization can be improved through simple technology, namely the processing of *Sonneratia alba* fruit into syrup. Mangrove fruit from *Sonneratia alba* processed into syrup has a high nutritional and antioxidant value and is rich in fibre, which is good for health. The nutritional value content of mangrove syrup from *Sonneratia alba* fruit is 1.20% protein, 0.20% fat, 3.50% carbohydrates, and vitamin C 55.30%. The vitamin C content in Sonneratia alba fruit syrup has less vitamin C content than fresh fruit. This is affected during the processing process. Therefore, more research is needed on the proper processing of mangrove syrup so that the nutritional content is not lost. The content of vitamin C in the mangrove syrup of Sonneratia alba fruit is very beneficial for the human body and can increase immunity.

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Authors Contribution

All researchers contribute to the research, ranging from data collection, data analysis, and manuscript preparation. The first author is responsible for preparing the manuscript, while the second, third, and fourth researchers assist with the editing process.

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