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

1Wintah, 1Kiswanto, 1Fitrah Reynaldi, 2Endah Sulistiyowati

1Faculty of Public Health, University of Teuku Umar, Aceh, Indonesia

2Faculty Sains and Tecnologi, University of Nahdhatul Ulama Purwokerto, Indonesia

**Corresponding author**: Wintah, e-mail: wintah@utu.ac.id

**Co-author** : KK: kiswanto@utu.ac.id, FR: fitrahreynaldi@utu.ac.id, ES:e.sulistiyowati@unupurwokerto.ac.id

**Submitted:**00/00/0000 **Revised:** 00/00/0000 **Accepted:** 00/00/0000 **Published online**: 00/00/0000

|  |
| --- |
| **doi:** <https://doi.org/10.35308/j-kesmas.v7i2.1646>**How to cite this article**: How to cite this article: write the bibliography of this article following the APA 6th Edition |

## Abstrac

Mangroves are plants that grow in coastal areas. 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. Processed mangrove syrup from *Sonneratia alba* fruit has nutritional content among others; protein 1.20%, fat 0.20%, carbohydrates 3.50%, and vitamin C 55.30%.

 **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) states that processed mangrove fruit into food products can be economically beneficial, in general mangroves benefit to reduce 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 useful 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 has adaptations to high salinity and is often found in areas that are directly facing the open ocean but not exposed to waves directly. Mangrove type *Sonneratia alba* which is often referred to as pedada fruit is a round fruit somewhat scab the end of the fruit is stemmed, and basically 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 in addition to being useful for processed food and beverages is also useful 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.

 Mangrove fruit in addition to being useful for processed food and beverages is also useful 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.

**Methods**

This research is experimental research. 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 important parameter for human needs to choose the drink to be consumed. Important parameters that need to be done to find out the nutritional value of mangrove syrup from *Sonneratia alba* fruit through proximate 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 |

**Discussion**

**Protein**

 Protein is one of the substances needed for the human body. Protein is useful as a building and building substance and as a 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 in accordance with the statement (Senior *et al*., 2013) the protein content in *Sonneratia alba* fruit syrup has a difference in value less than the protein content of fresh fruit Sonneratia Caseolaris of 1.22%.

**Fat**

 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 is in accordance with the opinion of Satuhu (2004) states that fruit that has a fat content greater than 0.1% suitable to be processed into food products.

**Carbohydrates**

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 results 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 Sonneratia Caseolaris fruit this is due to differences in ripeness in the fruit. This is in accordance with 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 high carbohydrate in mangrove syrup from *Sonneratia alba* fruit is also influenced by the addition of sugar because sugar is a simple carbohydrate. This is according to batista *et al*. (2011) sugar is part of carbohydrates. Fructose, glucose, sucrose, and rafinose are among the compounds from sugars.

**Vitamin C**

Vitamin C is very necessary 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) states that vitamin C plays an important role in preventing scurvy disease, a disease that causes paleness, fatigue, and gum bleeding.

The results of the test of vitamin C content in mangrove syrup from *Sonneratia alba* fruit amounted to 55.30%. Satoto research results (2020) the content of vitamin C mangrove syrup 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 the process of processing the fruit into syrup. This is in accordance with 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. Vitamin C contained in the fruit if heated for too long 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 rich in fiber so it 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 content of vitamin C in *Sonneratia alba* fruit syrup has less vitamin C content compared to 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 in mangrove syrup is not lost.

**Acknowledgment**

The researcher thanked all those who helped during the research process. Researchers thanked the organic chemistry laboratory, Faculty of MIPA Universitas Jenderal Soedirman who helped the process of analyzing the nutritional value of mangrove syrup from *Sonneratia alba* fruit.

**Authors Contribution**

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

**References**

A’in, C. , Suryanti., & Sulardiono, B. Kandungan Gizi Pada Produk Olahan Mangrove (KruMang, BoMang, dan SiMang) Produksi Kelompok Tani “Ngudi Makaryo”. Jurnal Info, 19 (1): 24-33.

<https://ejournal2.undip.ac.id/index.php/info/article/view/2183>

Almatsier, S. 2004. Prinsip dasar Ilmu Gizi. Gramedia. Jakarta.

Batista, C., Barros, L., Carvalho, A. M., & Ferreira, I. C. F. R. 2011. Nutritional and Nutraceutical Potential of Rape (*Brassica napus* L. *var. napus*) and “tronchuda” Cabbage (*Brassica oleraceae* L. *var. costata*) Inflorescences. Jaournal Food and Chemical Toxicology, 49:1208-1214. http://dx.doi.org/10.1016/j.fct.2011.02.023.

Matute, A. I. R., Soria, A. C., Sanz, M. L., & Castro, I. M. 2010. Characterization Of Traditional Spanish Edible Plant Syrups Based On Carbohydrate GC-MS Analysis. Journal Of Food Composition And Analysis 23(3):260-263. <https://www.cabdirect.org/cabdirect/abstract/20103204941>

Massot, C., Genard, M., Stevens, R., Gautier, H. 2010. Fluctuations in Sugar Content are not Determinant in Explaining Variations in Vitamin C in Tomato Fruit. Journal Plant Physiology and Biochemistry,48(9):751-757. DOI:10.1016/j.plaphy.2010.06.001.

Putri, P. M., & Setiawati H. Y. 2015.Analysis Levels Of Vitamin C In Fruit Fresh Pineapple (*Ananas comosus* (L.) Merr) And Fruit Canned Pineapple With Uv-Vis Spectrophotometry Method. Journal Wiyata, 2 (1): 34-38. https://ojs.iik.ac.id/index.php/wiyata/article/download/33/33

Rajis., Desmelati., & Leksono, T. 2017. Utilization of Pedada Fruit (*Sonneratia caseolaris*) of Mangrove for Syrup Production towards Costumer Acceptance. Journal Perikanan dan Kelautan, (22) 1: 51-60.

https://jpk.ejournal.unri.ac.id/index.php/JPK/article/download/5296/4968

Satoto, F & Sudaryanto, A. 2020. Pengolahan Buah Pedada Menjadi Sirup “Bogem” di Kawasan Wisata Hutan Mangrove Surabaya. Journal of Community Service Consortium, (1) 1: 32-40.

<http://jcscconsortium.com/index.php/jcsc/article/viewFile/3/20.>

Satuhu, S. 2004. Penanganan dan Pengolahan Buah. Penebar Swadaya. Jakarta.

Sumardjo, D. 2009. Pengantar Kimia: Buku Panduan Kuliah Mahasiswa Kedokteran dan Program Strata 1 Fakultas Bioeksakta. Penerbit Buku Kedokteran EGC. Jakarta.

Winarno, F.G. 2008. Kimia Pangan dan Gizi. M-Brioo Press. Bogor.

Wintah., Kiswanto., and Duana, M. 2018a. The Correlation Of Population Structure *Rhizophora apiculata* And Abundance Of *Geloina erosa* In The Mangrove Forest, West South Of Aceh. Journal of Aceh Aquatic Sciences. 1 (1): 96-101. <http://utu.ac.id/index.php/jurnal.html.>

Wintah, Heriyanti, P, A., & Kiswanto. 2018b. Kajian Nilai Gizi Dan Organoleptik Cokelat Mangrove dari Buah *Sonneratia alba.* Jurnal Litbang Kota Pekalongan, 15: 26-34. <https://jurnal.pekalongankota.go.id/index.php/litbang/article/view/74.>

Wintah., Duana, M., and Kiswanto. 2018c. The Measurement Of Carbon Stock That Stored To Artificial Mangrove Forest In Ex-Tsunami Area Of West South Of Aceh. Journalof Aceh Aquatic Sciences, 1 (1): 69-75. <http://utu.ac.id/index.php/jurnal.html.>

Wintah. 2018d. Analisis Zonasi Ekosistem Mangrove pada Kawasan Mangrove Bekas Tsunami di Aceh Barat Selatan. Jurnal Litbang Kota Pekalongan. 14: 90-94. <https://jurnal.pekalongankota.go.id/index.php/litbang/article/view/69.>

Wintah., Nuryanto, A., Pribadi, R., Sastranegara, H.M., Lestari,W., Yulianda, F. 2021. Distribution Pattern of Gastropods and Physical Chemical Factors in the Kebumen Mangrove Forest, Indonesia. Journal AACL Bioflux 14 (4): 1855-1864. http://www.bioflux.com.ro/docs/2021.1855-1864.pdf