

Organoleptic Study of Mangrove Pudding from *Sonneratia alba* Fruit

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ABSTRACT

Sonneratia alba is a mangrove species that grows in areas with salinity and is usually located in estuarine areas. *Sonneratia alba* produces fruit that can be used as an additional ingredient for making pudding. Previously there has been no study of organoleptic studies of *Sonneratia alba* pudding. Therefore, it is necessary to study the organoleptic of mangrove pudding from *Sonneratia alba* fruit. The organoleptic test consists of hedonic tests of taste, colour, aroma, and texture. *Sonneratia alba* pudding is made several treatments. The results of the hedonic test of *Sonneratia alba* pudding most preferred by panellists were in sample P2 with the composition of the ratio between *Sonneratia alba* juice 20% and agar flour 30%. Hedonic test results of taste (4.85), colour (4.62), scent (4.67), and texture (4.68).

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Introduction

Mangroves are one of the coastal ecosystems that have an important role in both ecological and economic functions (Wintah *et al.*, 2021a). Mangroves are unique ecosystems located in the transition zone between land and sea areas, and only occur in the tropics (Wintah *et al.*, 2023). Tropical areas are generally often found various types of vegetation, one of which is mangrove. The mangrove species whose fruit is widely used is the *Sonneratia sp.* (Zuraida *et al.*, 2020). *Sonneratia alba* has adapted to high salinity and is often found in areas directly facing the open sea but not directly exposed to waves (Wintah *et al.*, 2021b).

Sonneratia sp. is a mangrove plant that has a high quantity of fruit because when it is not in season, trees can still produce approximately 2 kg/day. *Sonneratia sp.* fruit can be processed into various processed food and beverage products (Wintah *et al.*, 2018). Pedada fruit (*Sonneratia sp.*) is a fruit whose base is wrapped in flower petals, spherical, and the tip of the fruit is stalked. The fruit is non-toxic and directly edible. Besides being useful as raw material for making food and drinks, mangrove fruit is also useful as medicine and cosmetics (Satoto and Sudaryanto, 2020).

Sonneratia sp. fruit in the coastal area of Klatakan Village, Situbondo Regency is used as raw material for making dodol food (Fitria, 2021). *Sonneratia caseolaris* is one of the mangrove fruits that is used as raw material for jam (Datunsolang, *et al.*, 2019). *Sonneratia caseolaris* mangrove fruit taken from the Gunung Anyar mangrove tourism area in the Medokan Sawah village of Surabaya is used as an ingredient for making syrup (Ayyubi *et al.*, 2022).

Syrup products are preferred by people in tropical climates (Novitasari *et al.*, 2020). Seaweed and fruit of *Sonneratia caseolaris* are used as raw materials for making jelly drinks (Putra *et al.*, 2021). *Sonneratia caseolaris* in Tanjung Jabung Barat, Jambi is utilized as pedada fruit juice (Dari, *et al.*, 2020).

Sonneratia sp. fruit has been widely used for various foods and beverages. The utilization of *Sonneratia sp.* fruit as an additional ingredient in pudding making has not been widely done. Pudding is a type of food made from starch, which can be in the form of flour-flour jelly or its processed products (Setyani, *et al.*, 2019). Misnaiyah *et al.* (2018) stated that pudding is one of the desserts made from various food ingredients consisting of agar, milk, sugar, and water which are processed by boiling.

Sonneratia alba is a mangrove species whose fruits can be utilized as processed ingredients in the form of mangrove pudding. Pudding is one type of dessert that is favored by the public because of its sweet taste and soft texture. *Sonneratia alba* pudding is a food that has not been studied for its nutritional and organoleptic content. Therefore, it is necessary to study the organoleptic study of *Sonneratia alba* pudding.

Method

The research was conducted by testing several alternative levels of *Sonneratia alba* pudding to produce the best physical quality, color, and taste of *Sonneratia alba* pudding. The treatments used were P0: 0%; P1: 10%; P2: 20%; P3: 30% *Sonneratia alba* fruit added from the amount of water with the addition of sugar at 20% each. *Sonneratia alba* fruit

that has been blended is squeezed with a cloth filter until separated between *Sonneratia alba* juice and *Sonneratia alba* pulp.

Organoleptic test of *Sonneratia alba* pudding to assess the processed mangrove chocolate through the sensory organs in the form of taste, color, scent, and texture (Safitri et al., 2022). The organoleptic test uses hedonic rating (liking) using a rating scale of 1 (very dislike), 2 (dislike), 3 (less like), 4 (like), and 5 (very like).

Results

The organoleptic test uses 25 trained panelists as consumer representatives and is asked to express their responses about liking or disliking using a rating scale of 1 (very dislike), 2 (dislike), 3 (less like), 4 (like), and 5 (very like) of *Sonneratia alba* pudding. Organoleptic tests included hedonic taste, color, aroma, and texture. Hedonic test results of taste, color, scent, and texture of *Sonneratia alba* pudding (Table 1).

Table 1. Hedonic test results of *Sonneratia alba* pudding

No	Treatment	Parameters			
		Taste	Color	Scent	Texture
1	P0	2,90	2,50	2,70	2,82
2	P1	3,35	3,65	3,66	3,73
3	P2	4,85	4,62	4,67	4,68
4	P3	4,42	4,35	4,33	4,35

Description;

P0 = *Sonneratia alba* fruit 0% : agar flour 50%

P1 = *Sonneratia alba* fruit 10% : agar flour 40%

P2 = *Sonneratia alba* fruit 20%: agar flour 30%

P3 = *Sonneratia alba* fruit 30%: agar flour 20%

Discussion

Organoleptic is a scientific method used to measure, analyses and present responses to a product based on human sensory abilities such as sight, smell, taste, and touch. Organoleptic test is a hedonic test (liking) is one of the consumer acceptance tests for a new product.

Taste

Hedonic test is a test used to measure the level of favorability of the product. One of the hedonics in pudding products is flavor. Taste is the stimulus produced by *Sonneratia alba* pudding after being eaten and felt by the taste buds so that the taste can be identified. Flavor is a very important parameter in determining a food product to the level of consumer acceptance. Datunsolang et al. (2019) stated that flavor is a sensory attribute that determines the hedonic quality value of a food product. Flavor is usually influenced by the interaction of other flavor components. Flavor is one of the organoleptic properties of a product that has consumer acceptance preferences for the quality of food or beverage products (Wintah et al., 2022).

The results of the hedonic test of *Sonneratia alba* pudding showed that panelists really liked the taste of pudding in treatment P2 with a ratio of 20%

mangrove and 30% agar flour. Hedonic flavor preference in the ratio of *Sonneratia alba* fruit and agar flour in the P0 treatment is 2.90 (less like), P1 treatment is 3.35 (like), P2 treatment is 4.85 (very like), P3 treatment is 4.42 (like).

The results of the hedonic test show that the taste of F count 76.15 is greater than F table 0.05 so that taste affects the *Sonneratia alba* pudding. The addition of *Sonneratia alba* fruit with various variations and the addition of sugar influenced the taste of the pudding. Apriliani (2015) states that sugar functions as a sweetening agent in a food as a flavor and scent giver. The addition of sugar in *Sonneratia alba* pudding can reduce the sour taste released from *Sonneratia alba* fruit.

Granulated sugar has a sweet taste and has a function as a preservative. Sugar can also affect taste by adding sweetness, affecting scent, texture, and can neutralize sourness, saltiness, and bitterness in food. Sulthoniyah et al. (2013) stated that taste can be influenced by several components such as chemical compounds, temperature, concentration and interaction with other flavor components. Salty and bitter taste stimuli can decrease and sweet taste stimuli will increase if there is an increase in temperature.

Color

Color has an important role in the quality of food products, color also influences consumer interest in food products. The results of the color parameter organoleptic test on the ratio of *Sonneratia alba* fruit and agar flour to pudding in the P0 treatment are 2.50 (do not like), P1 treatment is 3.65 (like), P2 treatment is 4.62 (very like), P3 treatment is 4.35 (like).

The hedonic test results that the color at F count 70.50 is greater than F table 0.05 so that color influences *Sonneratia alba* pudding. *Sonneratia alba* pudding is slightly brownish in color because the ripe *Sonneratia alba* fruit inside has a white-brown color. Pudding using *Sonneratia alba* juice more and more causes the color to be more intense brown. Color is an important assessment because color is the first visual that will have its own appeal to consumers (Al Ayyubi et al., 2022).

The natural brown color produced from mangrove juice gives a brown color that is preferred by panelists (Novitasari et al., 2020). Color is an important factor that must be considered in the presentation of food because color can arouse the taste of those who enjoy it (Iswendi et al., 2019). This is in accordance with the research of Arysanti et al. (2019) which showed that the higher the addition of dragon fruit as a natural color in pudding can increase the acceptability of the pudding product. Color plays an important role in food acceptance, giving clues to changes in food chemistry.

Scent

Scent is an attraction in the processing of food products. The scent spread by food is a very strong attraction and can stimulate the recipient's sense of smell so that it arouses appetite.

The results of the organoleptic test of aroma parameters in the comparison of *Sonneratia alba* fruit and agar flour against *Sonneratia alba* pudding in the P0 treatment are 2.70 (less like), P1 treatment is 3.66 (like), P2 treatment is 4.67 (very like), P3 treatment is 4.33 (like). The results of the scent hedonics show that the scent at F count 62.75 is greater than F table 0.05 so that the scent affects the *Sonneratia alba* pudding. This is influenced by the addition of *Sonneratia alba* fruit which has a distinctive scent, the higher the concentration of *Sonneratia alba* fruit addition, the stronger the scent produced. *Sonneratia sp* fruit contains volatile substances that will give *Sonneratia sp* fruit a fresh scent. The results of the scent hedonic test depend on the scent of the fruit used; the scent assessment depends on the nature of the food. Scent is a parameter of the level of panellist confidence in the quality of a product (Al Ayyubi *et al.*, 2022). The scent of *Sonneratia alba* pudding is influenced by the ratio between sugar, water, agar flour, and *Sonneratia alba* fruit juice.

The scent of food determines the delicacy of food. Foods that do not contain scent are less favoured by panelists. Good food can be felt by a good scent (Novitasari *et al.*, 2020). Food or beverage products that have a distinctive scent are a special attraction for consumers (Iswendi *et al.*, 2019). The scent of *Sonneratia alba* pudding has a distinctive scent because *Sonneratia alba* fruit contains volatile chemical compounds. The results of research by Arysanti *et al.* (2019) The scent that appears in food products is due to the presence of volatile and non-volatile chemical compounds. Wadhani *et al.* (2021) stated that the scent in vegetable pudding and strawberry fruit is due to the presence of volatile compounds in strawberry fruit.

Texture

Texture is used to express the physical form of the product. Texture characterizes a food as soft, rough, hard, chewy while in beverages it characterizes a watery physique. The texture produced in a food product is one of the physical properties that can determine the flavor in food. Pudding is a type of food made from agar flour and can be combined with other ingredients that produce a gel with a soft texture.

The results of the texture hedonic test on the ratio of *Sonneratia alba* fruit and agar flour to *Sonneratia alba* pudding in the P0 treatment are 2.82 (less like), P1 treatment is 3.73 (like), P2 treatment is 4.68 (very like), P3 treatment is 4.35 (like).

The hedonic test results that the texture at F count 55.25 is greater than F table 0.05 so that the texture affects the *Sonneratia alba* pudding. This is influenced by the addition of *Sonneratia alba* fruit. *Sonneratia alba* fruit has a fibrous texture, so the higher the concentration of *Sonneratia alba* fruit added to the pudding, the more the panelists liked it because of the softer texture of the pudding. Wadhani *et al.* (2022) stated that the texture of broccoli and strawberry pudding produced soft and chewy pudding products. Iswendi *et al.* (2019)

stated that the gel content in agar-agar can produce a soft and chewy pudding texture. Tamimi *et al.* (2019) stated that pudding with the addition of watermelon rind and orange peel did not affect the texture of the pudding.

Conclusion

Sonneratia alba is a fruit that has volatile compounds that give a distinctive aroma so that it is suitable for use as an additional material for making pudding. The results of the organoleptic test of *Sonneratia alba* pudding, the sample most favored by panelists was sample in treatment P2, namely with a ratio of 20% *Sonneratia alba* juice and 30% agar flour. Hedonic test results of taste, color, scent, and texture influence *Sonneratia alba* pudding. The addition of *Sonneratia alba* fruit with various variations and the addition of sugar influenced the taste of the pudding. *Sonneratia alba* pudding is slightly brownish in color because the ripe *Sonneratia alba* fruit inside has a white-brown color. The aroma of *Sonneratia alba* pudding is influenced by the ratio between sugar, water, agar flour, and *Sonneratia alba* fruit juice. *Sonneratia alba* fruit has a fibrous texture, so the higher the concentration of *Sonneratia alba* fruit added to the pudding, the more the panelists liked it because of the smoother texture of the pudding.

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Author Contribution and Competing Interest

All researchers contributed to the study, starting from data collection, data analysis, and drafting the manuscript. The first author was responsible for drafting the manuscript, while the second, third, and fourth authors helped with the editing process.

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