

## Organoleptic Test of Salam Leaves (*Syzygium polyanthum*) as an Herbal Drink with the Addition of Moringa Leaves (*Moringa oleifera* L.)

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### ABSTRACT

Tea is a fresh drink made from processed tea leaves. Bay leaves and Moringa leaves are used as the main ingredients in making this tea. *Syzygium polyanthum* and *Moringa oleifera* L. plants contain the same compounds, namely flavonoids and have anti-inflammatory properties. The purpose of this study was to measure antioxidant and flavonoid levels in the making of bay leaf tea with the addition of Moringa leaves, as well as conduct organoleptic tests in Kampung Dalam Village. This research method is experimental with quantitative data analysis, using four formulations in antioxidant and flavonoid tests, namely 80%: 20%, 70%: 30%, 60%: 40%, and 50%: 50%, as well as survey method with quantitative data analysis for organoleptic properties test. The results showed that the highest antioxidant and flavonoid levels were found in the 80:20% formulation, which were 13.22 ppm and 42.7500 mQE/g. The organoleptic assessment results showed that the 50%:50% formulation had the highest level of liking at 75% with a neutral description. In addition, the 70%:30% formulation has the highest aroma level of 77.5% with a scented description, the 50%:50% formulation has the highest taste level of 70% with a tasteless description, and the 50%:50% formulation has the highest color level of 67.5% with a yellowish green description. The conclusion is that the addition of moringa leaves as an herbal drink to bay leaves has a significant effect on liking, aroma, taste and color.

**Keywords:** Bay Lea; Moringa; Antioxidant Content; Flavonoid Content; Organoleptic Test.

### INTRODUCTION

Plantations are an important sector in Indonesian agriculture that has a huge impact on the development of agriculture in the country. One type of plantation that has long been developed in Indonesia is tea plantations. Indonesians have a long historical relationship with tea, and have made it a part of their daily lives. Tea contains various chemical compounds that can create a satisfying impression of color, taste, and aroma to the individual who enjoys it, thus making it a drink that continues to be popular and refreshing to this day (Anjarsari, 2016).

In general, tea is made from young tea leaves derived from the tea plant (*Camellia Sinensis*). The caffeine content in tea leaves provides a refreshing effect to the body. In addition, tea can also be prepared from other parts of the plant or flowers, known as herbal tea. Tea contains vitamins, including vitamin C and B vitamins, especially thiamin and riboflavin, which can support the process of protein absorption in the body. It should be noted that herbal tea is a type of tea that does not use tea leaves from the *Camellia Sinensis* plant (Rahmawati, 2015).

One plant that is popular among the public is *Moringa Oleifera* L. plants are shrubs that can grow in the lowlands up to an altitude of about 700 meters above sea level, with tree heights ranging from 7 to 11 meters. Moringa plants have green flower petals that bloom yellowish white. Throughout the year, the shape of the moringa plant resembles an elongated triangle or klentang in Javanese. The fruit is about 120 cm long and has a hard texture (Luthfiyah, 2015). For example, in the villages of Dolok Sinumbah and Raja Maligas, Hutabayu Raya sub-district, moringa leaves are used as antidiabetic, antihypertensive and anticancer. The physiological parts of moringa leaves that produce secondary metabolite

compounds are flavonoids, alkaloids, tannins, saponins, and terpenoids (Yulia *et al.*, 2023).

Bay leaves have a unique aroma that can enhance the palatability of dishes. Bay leaves also contain compounds such as niacin, fiber, and vitamin C, which are thought to have the potential to reduce serum triglyceride levels (Harismah, 2016). Meanwhile, *Syzygium Polyanthum* and *Moringa Oleifera L.* plants contain similar compounds, namely flavonoids, and have anti-inflammatory properties. Bay leaves and Moringa leaves are two important components in this study. Bay leaves are antibacterial and contain arna substances, shrub substances and essential oils. In the research of Purba and Idris (2023), essential oils, flavonoids, tannins and alkaloids contained in the combination of guava leaves and coconut fiber can inhibit microbial growth which can be used as a natural preservative for palm juice.

In a study conducted by Subekti (2018) on tea bags that combine moringa leaves and bay leaves, the results showed that the best combination was found in the K (40) S (60) treatment (40% moringa leaves: 60% bay leaves) with an antioxidant level of 92.05%. On the other hand, the lowest level occurred in the K (100) S (0) treatment (100% moringa leaves: 0% bay leaves) with an antioxidant level of 91.25%. In contrast, the lowest level occurred in the K (100) S (0) treatment (100% moringa leaves: 0% bay leaves) with an antioxidant level of 91.25%. In addition, based on the difficulty test conducted by Subekti, this tea has an antioxidant activity of 91.44%, with a slightly brownish yellow color, a slightly languid aroma, a slightly bitter taste, and slightly fragrant.

According to a study conducted by Kiptiah *et al.* (2014), they determined that to produce good quality bay leaf tea powder, the manufacturing process is done by drying the leaves in an oven at 110°C for 30 minutes, followed by 70°C for 1 hour. Hedonic testing results showed that many people preferred young bay leaf tea, with a rating of 7 (like). The novelty of this research with previous research is that herbal tea with a combination of moringa leaves and bay leaves provides additional health value because moringa leaves and bay leaves have the same content, namely flavonoid compounds and have anti-inflammatory properties. Moringa leaves also contain minerals and vitamins such as vitamin c, vitamin b6, vitamin a, bay leaves can help control blood sugar and cholesterol. This beverage innovation is more beneficial to overall health than.

In Kampung Dalam Village, located in Bilah Hulu District, *Syzygium Polyanthum* and *Moringa Oleifera L.* plants can be found in abundance. Bay leaf and Moringa plants are often found growing in the yard of the house, because these types of plants can grow well in the lowlands that are their habitat. Due to the easy availability of these laurel and moringa plants around the housing estate, the author chose to utilize these plants in his research.

The purpose of this study was to determine the antioxidant levels and flavonoid levels in *Syzygium Polyanthum* leaf tea with the addition of *Moringa Oleifera L.* And to determine the organoleptic test of *Syzygium Polyanthum* leaf tea with the addition of *Moringa Oleifera L.* in Kampung Dalam Village, Hulu Bilah District.

## METHODS

In this study, an experimental method combined with survey techniques was used. Sani (2018) argues that experiments are used to identify the impact of one

variable on another, while Sugiyono (2018) states that surveys are used to collect data from a number of panels or respondents. This research took place from July to August 2022. Sample testing was carried out at the Pharmaceutical Biology Laboratory of the University of North Sumatra, while organoleptic tests were carried out in Kampung Dalam Village, Bilah Hulu District. The population of this study was the entire Kampung Dalam Village, Bilah Hulu District. The sample taken was 10% of the total population of 400 people, namely 40 respondents.

To make tea powder, it is necessary to use leaves from bay and moringa plants taken directly from trees growing in Kampung Dalam Village, Bilah Hulu District. Evaluation was conducted through the use of the sense of taste, including aspects of aroma, taste, and color. Panelists were asked to provide a response by checking off on a prepared questionnaire. The hedonic scale was converted into a numerical scale that allows assessment based on the level of liking. The following table shows the hedonic scale range from excellent to unfavorable:

Table 1. Organoleptic Test Scale for Likeability

Hedonic Scale	Numeric Scale
Very Favorable	4
Like	3
Neutral	2
Dislikes	1

Table 2. Organoleptic Test Scale for Aroma

Hedonic Scale	Numeric Scale
Unscented	1
Somewhat Flavorful	2
Scented	3
Very Flavorful	4

Table 3. Organoleptic Test Scale for Taste

Hedonic Scale	Numeric Scale
Not Tight	1
Somewhat Sticky	2
Mats	3
Very Sticky	4

Table 4. Organoleptic Test Scale for Color

Hedonic Scale	Numeric Scale
Chocolate	1
Brownish Green	2
Brownish Yellow	3
Yellowish Green	4

Source: (Rampengan *et al.*, 1985)

In this research, the data collection method used is primary data. Primary data refers to information provided voluntarily to researchers, such as responses provided by respondents in surveys that are usually filled out by them.

Questionnaires are one of the data collection techniques in which participants fill out statements or questions before returning them to the researcher.

## RESULTS AND DISCUSSION

Testing of antioxidant levels in this study was carried out using methanol extract. Methanol solvent has the ability to attract polar and nonpolar molecules, including phenols, flavonoids, tannins, terpenoids, and saponins (Verdiana *et al.*, 2018). The *Diphenyl Picrylhydrazyl* (DPPH) technique is used as a method to measure antioxidant levels. In this situation, DPPH serves as a radical. When antioxidant compounds interact with DPPH free radicals, DPPH will turn into non-radicals and turn into diphenylpicrylhydrazine (Anwariyah, 2014).

Samples of bay leaf and moringa leaf extracts were added with 1 ml DPPH solution and 5 ml methanol (measured flask) with concentrations of 10 ppm, 20 ppm, 30 ppm, 40 ppm, and 50 ppm then the samples were incubated for 30 minutes. According to Irianti *et al.* (2016) that the stability time owned by DPPH is at 30-40 minutes because at that time DPPH will react with antioxidant compounds. And in the incubation process for 30 minutes the sample extracts of bay leaves and moringa experienced a color change from dark purple to yellowish yellow. This is in line with Molyneux (2015) that DPPH can react with antioxidants and experience color changes caused by antioxidants that will react with DPPH. The intensity of the color decreases due to DPPH radicals associated with hydrogen and react with antioxidants. The intensity of the purple color will decrease in line with the stronger antioxidant activity.

The concentration of the sample is measured by assessing its absorbance using a device called UV-Vis spectrophotometry at a maximum wavelength of 516 nm. The selection of this maximum wavelength is used to identify the wavelength that has the highest absorption and provides an optimal level of sensitivity, as well as reducing errors that may occur (Gandjar and Rohan, 2016). The results of free radical capture analysis on methanol extracts can be found in the following table:

Table 5. Results of Methanol Capture of Hail and Moringa Ex-Free Radicals

Sample Name	Formulation	Concentration (%)				
		10 ppm	20 ppm	30 ppm	40 ppm	50 ppm
Greetings+Counselor	80%:20%	20,733	32,646	63,344	81,328	86,025
	70%:30%	63,917	66,895	77,777	81,214	88,430
	60%:40%	43,528	65,521	79,496	86,597	87,399
	50%:50%	33,128	58,075	70,904	84,650	87,056

Based on table 5 above, it can be seen that the results of the percentage of immersion of *Syzygium Polyanthum Leaves and Moringa Oleifera L.* leaves vary. Each sample composition, ranging from formulations of 80% (bay leaf): 20% (Moringa leaves) to 50% (bay leaves): 50% (Moringa leaves), showed an increase in value at each concentration. This indicates that the higher the solvent concentration, the higher the value obtained in each sample.

In this case, a standard curve equation was used with the concentration of the antioxidant fraction as the x-axis and the percentage inhibition as the y-axis. This

standard curve equation was used to calculate the IC<sub>50</sub> value. IC<sub>50</sub> was calculated by estimating the value of x, i.e. concentration, using the regression equation on the methanol extracts of bay leaves and moringa leaves, as recorded in the table below in the IC<sub>50</sub> test results at the time of the study:

Table 6. Regression Equation Results of Methanol Ex-Methanol of Salam and Moringa Leaves

Sample Name	Formulation	IC <sub>50</sub> (ppm)	Description
Salam + Moringa	80% : 20%	13,2227	Very Strong
	70% : 30%	15,9615	Very Strong
	60% : 40%	18,7118	Very Strong
	50% : 50%	21,7167	Very Strong

An indicator of the capacity of antioxidants to prevent the formation of free radicals is the proportion of antioxidant content (also known as barrier). The more DPPH radicals the active compound is given, the higher the yield value and percentage of resistance obtained. (Rahayu *et al.*, 2015). It can be seen that bay leaf and moringa leaf extracts both have high or very strong antioxidant activity.

Based on the calculation results from table 6, each sample formulation has a significant IC<sub>50</sub> value. Antioxidant activity in the formulation of 80%: 20% formulation has the highest antioxidant level of 13.2227 ppm with a very strong description while the 50% formulation: 50% formulation has the lowest antioxidant activity value of the others which is 21.7167 ppm. Of the four samples with different formulations and IC values<sub>50</sub> on *Syzygium Polyanthum* leaf tea samples and *Moringa Oleifera L.* leaves can be seen in table 7 that the four formulations have different values but all four formulations have a very strong antioxidant category. According to (Kadji *et al.*, 2016) that antioxidant activity is categorized as very strong if it has an IC value of less than 50 ppm, and the category of weak antioxidant activity if the IC value is 150-200 ppm.

Table 7. Results of Total Flavonoid Analysis of Salam Leaf and Moringa Leaf

Sample Name	Formulation	% Flavonoid Content
Salam + Moringa	80% : 20%	42,7500
	70% : 30%	38,0450
	60% : 40%	35,4603
	50% : 50%	28,3990

In table 7, the results showed that there was a decrease in the value of flavonoid content from the initial formulation of 80%: 20% which reached 42.7500 mg QE/g until it reached the lowest flavonoid content value in the 50% formulation: 50% formulation at 28.3990 mg QE/g. The value of total flavonoid content in bay leaves and moringa leaves has a positive correlation with its antioxidant content. By utilizing a UV-Vis spectrophotometer with a wavelength of 430 nm, absorbance measurements were made. The color of the quercetin standard solution is yellow. According to Sri (2014) that the higher the concentration used, the more intense the color produced.

Total flavanoid levels found in *Syzygium Polyanthum* leaves and *Moringa Oleifera L.* leaves indicate that bay leaves and Moringa leaves have very strong antioxidant activity. This is in accordance with Erukainure's statement (2014) that

the higher the antioxidant activity in a sample, the higher the flavanoid content. According to Chotimah (2019), based on his previous research that the extract of *E. Subumbrans* leaves has very strong antioxidant activity with a level of 3.54 ppm, this value is higher than other sample extracts while *E. Subumbrans* leaf extract has a flavanoid content of 4.109%, this value is higher than other samples which shows that there is a relationship between antioxidant activity and flavanoid levels. This is in accordance with the statement of Handayani (2014) that flavanoids have the ability to react with DPPH free radicals so that they have a relationship and greatly affect the antioxidant strength.

## CONCLUSIONS

Based on the observations and discussion, it can be concluded that the highest antioxidant levels are found in the 80% formulation: 20% formulation, amounting to 13.22 ppm, while in the 50% formulation: 50% formulation, the antioxidant level is 21.72 ppm. The highest total flavonoid content was found in the 80%: 20% formulation, which amounted to 42.7500 mg QE/g, out of the other four formations. The results of the organoleptic test conducted in Kampung Village showed that the community gave a positive assessment of the 50% formulation: 50% formulation in terms of liking, taste, and color, while in terms of aroma, the 70% : 30% formulation received the highest rating of 77.5%. Further research is needed to test antioxidant and flavanoid levels in ethanol extracts to obtain a comparison with this study.

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