



The Effect of Drying Time on Activity Antioxidants and Organoleptic Properties of Leaf Herbal Tea (*Peronema Canescens* Jack)

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ABSTRACT

Sungkai Leaves have been used traditionally to treat various diseases, because sungkai leaves contains secondary metabolites that are rich in antioxidants. The aim of the study was to analyze the antioxidant activity and organoleptic properties of the herbal tea from sungkai leaves with variations in drying time of 30, 60, 90, 120, and 150 minutes. Measurement of antioxidant activity using UV-Vis spectroscopy DPPH method (*1,1-difenil-2-pikrilhidrazil*) with a wavelength of 515.5 nm. While the organoleptic test using the scoring test method. Organoleptic parameters include color, aroma, and taste. The results showed that the drying time treatment had an effect on the antioxidant activity of tea sungkai leaf herbal tea. Leaf drying at a temperature of 50°C with a drying time of 30 minutes gave the highest level of antioxidant activity with an IC₅₀ value of 126,8148 µg/ml. Drying time also affected the organoleptic properties of the herbal tea and sungkai.

Keyword :Sungkai ; Activity Antioxidants ; DPPH ; Herbal tea

INTRODUCTION

Sungkai plant (*Peronemacanesens*Jack) often referred to as jatisabrang, kisabrang, skinny sungkai, or sekai, is a plant that belongs to the *Lamiaceae* family. People in South Sumatra and Lampung use the leaves of sungkai(*Peronemacanesens*Jack) as antiplasmodium and fever medicine (Yaniet al., 2014). Sungkai leaves are used as a medicine for minor injuries by the people of the Riau Archipelago. Sungkai leaf decoction is used as a remedy for flatulence, constipation, high fever and as a mouthwash to treat dental infections (Kusri ani et al., 2015).

The results of the identification of chemical components of the sungkai plant showed that there were dominant compounds, namely quinic acid, guaiacol, hydroquinone, isovanilic acid, genkwanin, catechol, and benzoic acid. These compounds are a group of phenols that have strong antioxidant activity (Rosdiana, 2014). In the study, the determination of the total flavonoid content of the ethanol extract of sungkai leaves was 1.057 ± 0.002 mg EK/g extract and had antioxidant activity with an IC₅₀ value of 44,933 ppm so it was included in a very active antioxidant (Setyaningrum, 2019).

Free radicals are unstable and highly reactive molecules. This is due to the presence of unpaired electrons in their outer orbits, so free radicals will react with surrounding molecules to obtain their electron pairs and become stable (Iriantiet al., 2017).

Herbal teas do not only come from tea leaves, namely *Camellia sinensis*. Herbal teas are actually a mixture of several ingredients, and are more accurately called "tisanes" (Ravikumar, 2014). The principle of tea processing by drying method. Drying aims to inhibit microbial growth and prevent biochemical changes. At the time of drying with the same time interval can cause changes in quality such as aroma and appearance and can reduce antioxidant activity (Hossain et al., 2010).

Research on the effect of drying time on other herbal tea leaves was conducted with a sample of Chinese ketapeng leaves. In this study, it was shown that drying of Chinese ketapeng leaves at 50°C with variations in duration of 110, 130, 150, 170, 190 minutes produced strong antioxidant activity with IC₅₀ values of 60.18 g/ml at a drying time of 130 minutes. As well as sensory assessment, the color of the tea is yellow, it has the aroma of Chinese ketapeng leaves, and it has a sour taste (Yaminet al., 2017).

One of the tests to determine antioxidant activity is the DPPH method (*1,1-diphenyl-2-picrylhydrazil*). The DPPH method has been widely applied to estimate antioxidant activity in recent years (Molyneux, 2004). This DPPH method was found to be the most effective the two other antioxidant test methods used, namely the FIC (*Ferrous Ion Chelating*) and FRAP (*Ferric Reducing Antioxidant Power*) methods (Maesarohet al., 2018).

Based on the description above, researchers are interested in conducting a study on the analysis of antioxidants in sungkai leaf tea to explore the potential of sungkai leaf as a functional drink that can be used, among others, as herbal medicine. Researchers are interested in testing antioxidant activity using the DPPH method and UV-Vis Spectrophotometer.

MATERIALS AND METHODS

1. *Materials*

The tools used include: UV-Vis Double Beam Spectrophotometer (Shimadzu UV-1800), furnace (CarboliteGero), oven (Memmert), analytical balance (Presica), *Moisture balance analyzer* (Sartorius MA 30) and laboratory glassware. The materials used were 2 kg of fresh Sungkai(*Peronemacanescons Jack*) leaves, 1,1 Diphenyl-2- Picrilhydrazil(Aldrich) powder, methanol pa (CH₃ OH) (CV. Vahana Scientific), gallic acid (C₇ H₆ O₅) (Merck).

2. *Sampling and Determination of Sampling*

The sample was fresh Sungkai leaves obtained from Jalan Sungai LarehLubukMinturun Village, Koto Tengah District, Padang City, West Sumatra, Indonesia. The determination of the sample was carried out at the Andalas Herbarium, Department of Biology, Faculty of Mathematics and Natural Sciences, Andalas University (UNAND) Padang. The samples that were determined were the roots, stems, leaves, flowers, and seeds of plants.

3. *Simplified Setup*

The raw material is the young sungkai leaves taken from the sungkai plant. Leaf collection was carried out in the morning. Sungkai leaves were taken as much as ± 2 kg. Sungkai leaves that have been taken, then carried out wet sorting. Wet sorting is done to separate dirt or other foreign material from the sungkai leaves. Damaged leaves, twigs that are still attached to the leaves, and other impurities that must be removed immediately, in order to obtain sungkai leaves that are suitable for use.

Furthermore, washing is carried out to remove soil and other impurities attached to the sungkai leaves. Washing is done with clean water and carried out in a short time so as not to remove the nutritious substances in the sungkai leaves. Sungkai leaf simplicia drying aims to get simplicia that is not easily damaged so that it can be stored for a long time. Sungkai leaf simplicia drying was carried out by aerating for 18 hours. Dry sorting aims to separate foreign objects, such as unwanted plants and other impurities that are still present or left on the dried simplicia of Sungkai leaves.

4. *Simple Making of Sungkai Leaf Tea*

How to make sungkai leaf tea Teabags consist of two main ingredients, namely tea leaves which are processed into ready-to-use tea and filter paper. Here are the complete steps for making tea bags: 1) Drying, Samples that have been air-dried and sorted are dried again using the 50°C temperature method using an oven with variations in drying time of 30, 60, 90, 120, and 150 minutes, 2) Milling, After drying, the sungkai leaves are cut with a rotating knife. into various degrees of fineness, 3) Weighing After blending, the tea is then stored and weighed into 2 grams each. 4) Packaging, the tea that has been weighed is then put in a teabag

5. *The process of making Leaf Tea Preparations Sungkai*

The tea ingredients that have been dried are based on variations in drying time of 30, 60, 90, 120 and 150, Formulated with the addition of stevia leaves, mint leaves and jasmine flowers in 2 gram teabags, weight percentage of each ingredient: Leaves Sungkai 1 gram, Stevia Leaf

0.5 gram, Mint Leaf 0.25 gram, Jasmine flower 0.25 gram. Each drying tea bag is brewed with 250 ml of boiling water, then let stand for 5 minutes, then the tea bag is removed from the solution and cooled at room temperature.

6. *Antioxidant Activity Test*

a. *Preparation of 30 . DPPH Solution*

Carefully weighed approximately 10 mg of DPPH (BM394.33). Then dissolved in methanol up to 100 mL, then placed in a volumetric flask lined with *aluminum foil* . Sufficient solvent to mark the limit then shake until homogeneous and obtained DPPH solution with a concentration of 100 g/ML.

b. *Preparation of DPPH Maximum Wavelength Optimization Blank Solution*

Pipette 3.8 mL of DPPH 30 solution (µg/mL) into the vial. Then 0.2 mL of methanol pa was added and homogenized and the vial was covered with *aluminum foil* . Then incubated in a dark room for 30 minutes.

c. *Comparison Solution Gallic Acid*

10 mg of pure gallic acid was weighed, put in a 100 mL volumetric flask, then added methanol pa to 100 mL (100 g/mL) and homogenized.

d. *Making Gallic Acid Calibration Curve*

Next, a series of concentrations of 4 g/mL, 8 g/mL, 12 g/mL, 16 g/mL and 20 g/mL was made, by pipetting the mother liquor (100 g/mL) as much as 0.4 mL, 0.8 mL, 1.2 mL, 1.6 mL and 2 mL and then filled with methanol pa to the 10mL laboratory measuring limit mark.

e. *Sungkai Leaf Antioxidant Activity Test*

Enter 3.8 mL of DPPH 30 g/mL solution into the vial and add 0.2 mL of the dried sungkai leaf tea test solution at drying times of 30, 60, 90, 120, and 150 minutes. Each mix homogenized and left for 30 minutes in the dark. As a control, 30 g/mL DPPH solution was used without the addition of the test solution.

7. *Data Analysis Method*

The results of the research obtained were both the antioxidant activity test and the organoleptic test were analyzed quantitatively using SPSS. The data was tested using the AnovaOneway test Friedman. With Hypothesis Ho: there is no significant difference from several treatment groups and Hi: there is a significant difference from several treatment groups

RESULTS AND DISCUSSION

RESULTS

After conducting research on Making Sungkai Leaf Herbal Tea and testing the antioxidant activity of Sungkai Leaf Herbal Tea (*Peronemacanes Jack*) the following results were obtained:

a. *The results of the evaluation of Sungkai Leaf Simplicia(Peronemacanes Jack)*

Organoleptic examination of Sungkai leaf simplicia powder Form: Fine powder

Color: Brownish green

Smell: Distinctive, slightly pungent Taste: Bitter

2. Results of non-specific characteristics of Sungkai leaf simplicia

- a. The average water content of simpliciasungkai leaves drying for 30 minutes is 9.29 ± 0.21 , 60 minutes is 8.35 ± 0.23 , 90 minutes is 6.48 ± 0.09 , 120 minutes is 5.11 ± 0.06 , 150 minutes is 3.45 ± 0.15
 - b. Total ash content of simpliciasungkai leaves drying 30 minutes 13.6852, 60 minutes 12.8083, 90 minutes 12.2280, 120 minutes 9.5487, 150 minutes 9.5447
2. The results of the phytochemical screening of Sungkai leaf simplicia. The results are as follows: Flavonoids (+) Alkaloids (+) Saponins (+) Phenols (+) Tannins (+).

b. *Results of Evaluation of Organoleptic Properties of Sungkai Leaf Herbal Tea (Peronemacanes jack)*

1. **Organoleptic examination (color)** of Sungkai leaf herbal tea was carried out visually which consisted of five drying times, namely drying 30, 60, 90, 120 and 150 minutes. Of the five herbal teas, the tea color is not uniform, namely . For drying 30, 60, 90, 120 and 150 minutes of color testing through the hedonic test with an average value of 0.005 on the Friedman test.
2. **Organoleptic examination (Aroma)** of Sungkai leaf herbal tea was carried out visually which consisted of five drying times, namely drying 30, 60, 90, 120 and drying 150 minutes. Of the five herbal teas have a tea aroma that is not uniform, namely . For drying 30, 60, 90, 120 and 150 minutes of testing through the hedonic test with an average value of 0.008 on the Friedman test.
3. **Organoleptic examination (taste)** of Sungkai leaf herbal tea was carried out visually which consisted of five drying times, namely drying 30, 60, 90, 120 and 150 minutes. Of the five herbal teas have a tea taste that is not uniform, namely . For drying 30 minutes, 60, 90, 120 and 150 minutes of taste testing through the hedonic test with an average value of 0.005 on the Friedman test.

DISCUSSION

In this study, ± 2 kg of fresh sungkai leaves were taken and then aired for 18 hours and dried again in the oven at 50°C and mashed by blending until they become powder and then stored in a tightly closed container. Sungkai leaf simplicia powder produced is as much as 500 grams.

Furthermore, specific and non-specific characterization testing of Sungkai leaf simplicia, specific characterization was carried out by means of identity testing, organoleptic, non-specific characterization testing was carried out by testing water content, and testing total ash content.

In this study, the total ash content of sungkai leaves was 13.6853% drying for 30 minutes, drying for 60 minutes 12.8083%, drying for 90 minutes 12.2280%, drying for 120 minutes 9.5487% and drying for 150 minutes 9.5447%. The results of the total ash content obtained meet the requirements stated in the Ministry of Health of the Republic of Indonesia (2000), which is no more than 25%.

Screening test results Sungkai leaf herbal tea contains flavonoids, alkaloids, saponins, phenols, tannins and steroids the content of these compounds can fade the antioxidant content in the sample marked from blackish purple to orange color contained in the sample.

The color of a good brew of tea is the hallmark of the product. The average results of the researcher's assessment of the steeping color of Sungkai leaf herbal tea on 30 minutes of drying chose the color of the tea to be yellowish green, 150 minutes of drying brownish yellow. The longer the drying time, the color of the Sungkai leaf herbal tea will fade. The color of steeping sungkai leaf herbal tea is formed from yellowish green to yellow.

In testing the aroma of steeping sungkai leaf tea at drying 30, 60, 90, 120, and 150 minutes there was no significant change.

Based on SNI 3836 (2013), the aroma of good brewing tea is typical of tea products. The results of the panelists' average assessment of the steeping aroma of sungkai leaf herbal tea were found at 30, 60, 90, 120 and 150 minutes of drying which had a distinctive aroma.

Determination of antioxidant activity was carried out on sungkai leaf herbal tea in the drying treatments of 30, 60, 90, 120 and 150 minutes. In addition, in this study gallic acid was used as a comparison because gallic acid is a compound that has a large antioxidant activity and as a comparison to find out how strong the antioxidant potential is in the drying treatment of sungkai leaf herbal tea compared to gallic acid.

In testing the antioxidant activity of sungkai leaf herbal tea, each drying treatment of sungkai leaf herbal tea, each sample and comparison was made in various concentrations using methanol as solvent. Then DPPH solution was added and incubated for 30 minutes in a dark place. The incubated sample solution was then measured for its antioxidant potential with a UV-Vis spectrophotometer at an absorption wavelength of 515.50.

The results of the antioxidant activity test using the DPPH method of Sungkai leaf herbal tea and antioxidant levels (IC₅₀). where the comparison antioxidant activity is gallic acid, the IC₅₀ value is 18.2623 g/ml, the antioxidant activity of sungkai leaf herbal tea in the test gives an IC₅₀ value of 126.8148 – 157.5565 g/ml. showed that drying at a temperature of ±50°C could increase the antioxidant activity in the preparation of sungkai leaf herbal tea from moderate to weak because the antioxidant compounds had been damaged.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research that has been done with the manufacture of sungkai leaf herbal tea based on the drying time, it can be concluded that:

1. The drying time of sungkai leaf herbal tea has an effect on water content, ash content, antioxidant activity, organoleptic properties including taste, color and aroma.
2. Drying of sungkai herbal tea was dried for 30 minutes which resulted in sungkai leaf herbal tea with the highest antioxidant activity with an IC value of 126.8148 g/ml.

SUGGESTION

It is suggested to further researchers to conduct further research on the effect of sungkai leaf herbal tea products on the quality and antioxidant activity of the drying time using the drying temperature method.

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