



Efficacy Of Sungkai Plant (*Peronema canescens* Jack) As Covid-19 Protection

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ABSTRACT

Introduction: Sungkai plant (*Peronema canescens* Jack) is a very abundant plant growing in West Sumatra. Sungkai is one of the ethnobotanical plants that is used as a source of traditional medicine and is typical (endemic) Indonesia. Sungkai can also reduce blood sugar levels in diabetic mice after reducing urine volume by sungkai, antihyperuricemia, immunostimulant, anti-inflammatory, antibacterial, antioxidant and has sunscreen activity.

Objective: Knowing the efficacy of the sungkai plant (*Peronema canescens* Jack) in improving the human body's immune system in protection against Covid-19.

Methods: Literature Review. Data sources come from research journals on the efficacy of sungkai plants that can improve the body's immune system from various national and international sources. The data search strategy used was to search directly for gray literature through the Google search engine and use the Google Scholar, Pubmed and Science Direct databases with the keywords "Efficacy of Sungkai as Covid-19 Protection" or "Efficacy of Sungkai as Covid-19 Protection". Inclusion criteria included national journals on the efficacy of sungkai plants with Sinta accreditation 1-6, and Scopus-indexed international journals with rankings Q1-Q4. Exclusion criteria include journals that are not focused on discussing the efficacy of sungkai plants, unaccredited journals, and research journals with review methods.

Results: From national and international journals that have been reviewed, it is found that sungkai plants are proven in experimental studies to be able to improve the human immune system as seen from several parameters of monitoring human body immunity such as IL-6, TNF alpha, Leukocytes, and Eusinophils.

Conclusion: Based on the results of the literature review above, it can be concluded that sungkai plants play a role in improving the human immune system through several different mechanisms of action. Currently, the use of drugs derived from plants is an option by the community in preventing and treating diseases, especially as immunostimulants in the event of a COVID-19 attack.

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I. INTRODUCTION

Sungkai plant (*Peronema canescens* Jack) is a very abundant plant growing in West Sumatra. Sungkai is one of the ethnobotanical plants that is used as a source of traditional medicine and is typical (endemic) of Indonesia. The potential of sungkai can be developed for antihyperuricemia drugs (1). Sungkai plant (*Peronema canescens* Jack) is used by the community as medicine for malaria, pain relief, heat reduction and also to maintain health. Sungkai can also reduce blood sugar levels in diabetic mice after reduction of urine volume by sungkai, antihyperuricemia, immunostimulant, anti-inflammatory, antibacterial, antioxidant and has sunscreen activity (2).

Dayak people in East Kalimantan still use sungkai in the treatment of diseases. The young leaves are used as mouthwash to prevent toothache and fever. According to Yusrin (2008), in the treatment of the Serawai tribe in South Bengkulu, sungkai leaves are pounded and given to bruises. The Suku Anak Dalam (SAD) tribe in the Bukit Duabelas National Park (TNBD) area of Jambi uses sungkai bark for external wounds, internal wounds, and bloody diarrhea. The utilization of sungkai bark for traditional medicine is knowledge and skills that have been passed down from generation to generation by the tribe. (3).

The Dayak people in East Kalimantan still maintain the habit of utilizing plants around them as medicine and health care, such as the sungkai plant (*Peronema canescens* Jack), a verbenaceae tribe that is taken

from young leaves as a cold medicine, fever, worming medicine, there is also a mandian for women who have just given birth. (4).

Sungkai skin can be used as a natural antioxidant and sungkai leaves can boost the immune system. So that this traditional treatment can be used in the health care system and in accordance with the rules of formal health services, which must be medically accountable. In addition, sungkai skin also has potential as a natural antioxidant (4).

The literature study of this Sungkai plant extract is as follows: Yani's research (2014), *Peronema canescens* Jack dose of 0.5625 mg/kgbb can increase the number of leukocytes by 36%. The results of Ningsih's research (2013), that the ethanol extract of *Peronema canescens* Jack leaves has antiplasmodium activity in vivo with an ED50 value of 102.88 mg / kgbb. Arna Ningsih's research (2013) examined the n-hexane extract of Sungkai leaves to provide growth inhibition against all test bacteria at a level of 1 mg/ml. Research on the activity of hand antiseptic gel preparations made from ethanol fraction extract of Sungkai leaves (*Peronema canescens* Jack) against several pathogenic bacteria (5). Research on Antiplasmodium Activity Test of n-hexane Fraction of Sungkai Leaf (*Peronema canescens* Jack) against *Mus musculus* (5). Research on Antiplasmodium Activity Test of n-hexane Fraction of Sungkai Leaf (*Peronema canescens* Jack) against *Mus musculus* (6).

Potential of Sungkai Young Leaves (*Peronema canescens* Jack) for Health (immunity) in mice (*Mus musculus*) (7). D Fransiska, (2021) has examined the Antibacterial Activity Test of ethanol extract of Sungkai leaves (*Peronema canescens* Jack) against the growth of *Escherichia coli* using the Kirby-Bauer disc diffusion method. Research by Herni Kusriani, (2020) concluded that ethanol extract of Sungkai stem bark has no antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*, while Sungkai leaf extract and ethyl acetate fraction, and methanol have Minimum Inhibitory Concentration (KHM) and Minimum Kill Concentration (KBM) against *Staphylococcus aureus* respectively 1024 µg/ml, 1024 µg/ml and 512 µg/ml, while against *Escherichia coli*, extracts and fractions have KHM and KBM 512 µg/ml. From the results of bioautography against *Staphylococcus aureus* and *Escherichia coli* bacteria, it can be concluded that compounds that have antibacterial activity from extracts and fractions of Sungkai leaves are thought to be alkaloid and flavonoid compounds.

Madyawati's research, 2021 concluded that a dose of 500 mg / kgbb of ethanol extract of Sungkai leaves can reduce uric acid levels. Nadya's research (2020) examines the efficacy of the hexane fraction of Sungkai leaves to reduce cholesterol levels and betulinic acid as an active compound from the triterpenoid group. Arsyik's research (2012), examines the test of the content of secondary metabolite compounds of Sungkai leaves, namely alkaloids, terpenoids, flavonoids, and tannins and as anti-bacterial. According to Ningsih and Subehan (2013) from the isolation of n-hexane extract of Sungkai leaves (*Peronema canescens* Jack) obtained one compound, namely isolate B1, based on chemical reagent data isolate B1 is positive for terpenoid compounds, UV spectra data with a maximum wavelength of 207 nm, and IR data of active isolate compounds contain OH (hydroxyl) -CH- aliphatic functional groups, C=O (carbonyl), C-O (ketone), C=C- (cyclic or aromatic esters), and CH₂ and CH₃ (alkyl aliphatic). According to Hollman (1996) in Gresinta (2012), compounds that have bioactivity as immunostimulating agents are polysaccharide compounds, terpenoids, alkaloids and polyphenols (7).

Sungkai plant (*Peronema canescens* Jack) is one of the medicinal plants that has been widely used as medicine such as medicine for malaria, antiplasmodium, pesticides, antipyretics, immunity, and teratogenicity. The content of secondary metabolite compounds contained in sungkai leaf extract is such as alkaloid, terpenoid, steroid, flavonoid, and tannin compound groups, and there are seven types of clerodane diterpenoid compounds contained, namely peronemin A2, A3, B1, B2, B3, C1, and D1 (8).

According to Pindan 2021, ethanol extracts from sungkai leaves have been shown to contain alkaloids, flavonoids, steroids, triterpenoids, phenolics and saponins. The flavonoid compound here acts as an analgesic by reducing the production of prostaglandins, where the mechanism of the flavonoid compound is by inhibiting the work of the cyclooxygenation enzyme so that it can reduce pain (2). In sungkai leaves there are bioactive compounds such as triterpenoids, alkaloids, flavonoids, phenolics, steroids and saponins, where these compounds are believed to have antioxidant activity (9).

The types of secondary metabolites found in sungkai leaves in crude extracts are alkaloids, flavonoids, phenolics, steroids and saponins. In the n-hexane fraction there are compounds such as steroids, flavonoids and triterpenoids. Furthermore, the ethyl acetate fraction contained compounds such as alkaloids, triterpenoids and steroids and the remaining ethanol fraction was alkaloid, flavonoid, phenolic, steroid and saponin (4).

In this literature review, examine the efficacy of sungkai leaves that can play a role in maintaining the body's immune system, especially when attacked by the Covid-19 virus. In various conditions that can reduce the human body's defense system so that with the existence of sungkai leaves which contain secondary metabolites that play a role in increasing the immune system, there is a need for more studies on the efficacy of sungkai leaves.

II. METODE

The method used is literature review. Data sources come from research journals on the efficacy of sungkai plants that can improve the body's immune system from various national and international sources. The data search strategy used is to search directly for gray literature through the Google search engine and use the Google Scholar, Pubmed and Science Direct databases with the keywords "Efficacy of Sungkai as Covid-19 Protection" or "Efficacy of Sungkai as Covid-19 Protection". Inclusion criteria included national journals on the efficacy of sungkai plants with Sinta accreditation 1-6, and Scopus-indexed international journals with rankings Q1-Q4. Exclusion criteria include journals that are not focused on discussing the efficacy of sungkai plants, unaccredited journals, and research journals with review methods.

PEMBAHASAN

Herbal medicine is recognized as having an important role in controlling infectious diseases. Moreover, several studies have shown that a combination of herbal medicine and modern medicine can alleviate symptoms and improve the quality of life of COVID-19 patients. Moreover, in China and South Korea, herbs that are frequently used to treat COVID-19 include Citri reticulatae pericarpium, Glycyrrhizae radix Rhizoma, and Agastachis Herba. Typically, these herbs are suggested for COVID-19 patients who show clinical signs of fever, fatigue, and digestive problems. In another study, in the Merangin area, one of the districts in Jambi Province, Indonesia, a decoction of Sungkai (*Peronema canescens*) leaves has been used as one of the medicinal plants given to patients suffering from COVID-19. The local community believes that consuming sungkai leaf decoction combined with conventional medicine can accelerate the healing of patients with confirmed COVID-19 (10).

The effect of sungkai extract on the percentage of leukocyte cells increased significantly conducted by Dillasamola (2021). Animals given 200 mg / kgbb and 400 mg / kgbb doses of sungkai extract showed good results with the same percentage of lymphocyte cells as the control group ($p > 0.05$). Meanwhile, the 800 mg / kgbb dose of sungkai extract showed higher results in the percentage of lymphocyte cells than the 200 and 400 mg / kg doses and the same effect as the 50 mg / kgbb dose of stimuno ($p < 0.05$). The increase in the percentage of lymphocyte cells indicates that sungkai ethanol extract can stimulate an increase in specific immune responses. Sungkai test on cell viability aims to determine whether sungkai is safe and non-toxic to RAW 264.7 cell survival using MTT (microtetrazolium), which calculates the number of living cells (viability) by looking at the absorption value measured using a microplate reader with a wavelength of 550 nm. Cell viability obtained with 3 repetitions for concentrations of 1, 10, and 100 μ g/mL were 128.08; 128.83; 135.82%. The sample can be said to be safe and non-toxic to cells if the cell viability value is above 90% (11).

P. canescens leaf extract has immunostimulatory effects on white mice

(*Mus musculus* L.) males. *P. canescens* leaves are reported to contain seven clerodane-type furanoditerpenoid compounds from the acetone extract of *P. canescens* leaves, as well as two glycoside compounds, namely caffeic acid glycoside and two glycoside compounds, namely caffeic acid glycoside. Extracts from young sungkai leaves contain active compounds such as peronnemin, sitosterol, isopropanol, phytol, and diterpenoids (12).

Based on the results obtained, sungkai is safe and non-toxic for RAW 264.7 cells. The results of the Sungkai Test 1, 10, and 100 μ g/mL have a significant effect on the survival of RAW 264.7 cells ($p < 0.05\%$) followed by the Duncan test, namely there is no difference in each concentration of 1, 10, 100 μ g/mL. After knowing that sungkai with concentrations of 1, 10, and 100 g/mL is safe and non-toxic, further testing can be carried out, namely the immunostimulant activity of sungkai by measuring the levels of TNF- and IL-6 cytokines which are pro-inflammatory cytokines with lipopolysaccharide (LPS) as an inducer and using sandwich ELISA (Enzym-Linked Immunosorbent Assay), which is a specific complex bonding reaction between antigens and antibodies using enzyme assistance. The immunostimulant activity of sungkai is caused by the flavonoids contained in it. According to Devagaran & Diantini (2012) that flavonoids, curcumin, limonoids, and catechins can increase the activity of the immune system (11).

From the immunostimulant test research data, it was found that Sungkai leaf extract (*Peronema canescens* Jack) has excellent immunostimulant activity compared to Gambir and Pegagan Embun which is characterized by increased levels of TNF- α and IL-6 compared to the control in RAW 264.7 cells which are proinflammatory cytokines produced in the early phase of inflammation in phagocytosing pathogens that enter the body. The more proinflammatory cytokines produced, the more the body's immune system increases in fighting pathogens. Compounds that can enhance the immune system can be called immunostimulants (13).

The existence of immunostimulant activity in sungkai is due to the content of quercetin contained in it. Gambir is known to have the main compound quercetin which is a flavonoid group. According to Devagaran & Diantini (2012) that flavonoids, curcumin, limonoids, and quercetin can increase immune system activity (14). In addition, Gambir also contains ketekin which is also a flavonoid and Pegagan Embun also contains flavonoid compounds in the form of rutin so that it can also act as an immunustimulant.

Increased levels of TNF- α and IL-6 due to flavonoids can induce NF- κ B (nuclear factor-kappaB). NF- κ B is a transcription factor that can induce gene transcription in cells that will play a role in immune response, cell proliferation and cell survival (15). When NF- κ B is activated, NF- κ B will stimulate the immune response, one of which is the production of proinflammatory cytokines (TNF- α and IL-6), which then stimulates NF- κ B activation again (feedback positive mechanism) so that the immune response can last long. Thus, with the activation of NF- κ B, the amount of cytokines TNF- α and IL-6 produced also increases (16,17).

Based on research (Yani et al., 2014.) regarding the potential test of young sungkai leaves (*Peronema canescens*) for immune health in mice, it shows that the administration of sungkai leaf extract has an effect on immunity. Where leukocytes are cells that form blood components so that the increased content of white blood cells can help the body fight various infectious diseases, as part of the immune system. The administration of sungkai leaf extract is more effective than the administration of imonos as a comparative drug imonos as a single drug, while the sungkai extract contains several active substances, namely peronemin, sitosterol, isopropanol, phytol, dipterpenoids and flavonoids so it is possible that these elements help increase the number of leukocytes. In the immunity test, the most effective dose in helping the immune system with a dose of sungkai leaf extract of 0.567 mg/kgBB, tends to increase the number of leukocytes by 36% better than the comparison dose which only increases the number of leukocytes by 23%. In research, the dose that provides the maximum analgesic effect in inhibiting pain and reducing writhing in test animals is the EEDS 300 mg / kgBB group (18).

III. CONCLUSIONS

Based on the results of the literature review above, it can be concluded that sungkai plants play a role in increasing the human body's immune system through several different mechanisms of action. At present, the use of drugs derived from plants is an option by the community in preventing and treating diseases, especially as immunostimulants in the event of a COVID-19 attack.

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