



Study On The Efficacy Of *Peronema Canescens* Jack. Leaves As An Immunomodulator Used In Traditional Medicine

Dwisari Dillasamola^{1*}, Hansen Nasif¹, Biomechy Oktomali Putri², Noverial²

¹Faculty of Pharmacy, Universitas Andalas, Padang 25163, Indonesia

²Faculty of Medicine, Universitas Andalas, Padang 25163, Indonesia

*Corresponding author

ABSTRACT

Introduction: The Sungkai plant (*Peronema canescens* Jack) is widely used as an immunostimulant. Sungkai (*Peronema canescens* Jack.) is one of the leading export commodities, especially for the Sumatra and Kalimantan regions. Sungkai leaf (*Peronema canescens* Jack.) is a natural source of flavonoids.

Objective: To find out the efficacy of sungkai leaves so that they can be used as traditional medicine for the community.

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 "Peronema canescens Plant", "Traditional Medicine", or "Efficacy of Sungkai Leaf". 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 the national and international journals that have been reviewed, it was found that the sungkai plant has efficacy as an immunostimulant, in fertility, and has been tested for safety in pre-clinical animal tests and for generations by the community.

Conclusion: Based on the literature that has been collected, it can be concluded that there are many studies on sungkai leaf extracts that are effective in maintaining endurance and have proven safety.

Received 01 Aug., 2024; Revised 08 Aug., 2024; Accepted 10 Aug., 2024 © The author(s) 2024.

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I. INTRODUCTION

The sungkai plant (*Peronema canescens* Jack) is a wellknown herb for the treatment of various health problems by the people of Indonesia for centuries (1).

The Indonesians see several herbal plants as natural fertility enhancers. One such herb is pegagandew which contains isoflavone flavonoids, saponins, and alkaloids that promote mammal estrogen production. Pegagan dew leaf extract effectively increases the number of ovarian follicles at low doses. According to studies, gandarusa leaf, which contains flavonoid compounds in the form of isoflavones, can increase the endogenous hormone estradiol and the number of secondary follicles. These plants contain secondary metabolites, almost the same as the sungkai plant. The results of the phytochemical test on Sungkai revealed that the plant contains various secondary metabolites, including alkaloids, steroids, terpenoids, tannins, and saponins. Another research shows that the ethanol extract of sungkai leaf also contains phenolics, anthraquinones, and flavonoids. Flavonoids are polyphenols found in many plants (2).

Sungkai plants (*Peronema canescens* Jack) are widely used as immunostimulants. Research conducted by Dillasamola (2023) found that the toxicity of ethanol extract of Sungkai leaves on the observation of the ratio of kidney organs showed that there was a significant effect of dose variation and duration of administration on the ratio of kidney organs (3).

Sungkai leaf decoction is also used by local residents in the Curup area, Bengkulu Province as a cure for malaria. In the treatment of the Dayak Tunjung tribe in East Kalimantan, young sungkai leaves are used as a fever medicine while the roots are used as a diuretic and body aches medicine (4).

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 use of traditional medicine has been known long before the existence of formal health services by considering its benefit empirically. Nowadays, herbs are used as a complement to primary treatment. In the last decade, many have turned to traditional medicine products and practices with the assumption that natural means safe, which is not necessarily true. All effective drugs can have adverse reactions, including herbal medicines. For this reason, in the use of herbal medicine, it is important to consider the dose, time of use, method of use, and selection of drugs for the disease. The immune system can be divided into two types: the nonspecific immune system (innate immunity) and the specific immune system (adaptive immunity). The nonspecific immune system has faster activity because it does not involve the memory cells. Several components that are involved in the nonspecific immune system are macrophage cells (phagocytic white blood cells) and natural killer cells, which protect the body from pathogen attacks so that the body eventually builds its defence system. The body's defence system can be activated by providing compounds that can increase the body's immune response (1).

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).

From the results of immunostimulant testing of 3 sungkai leaf isolates, it was found that (S)-4-methylheptyl 1H-imidazole-4-carboxylate had an immunostimulant effect in increasing Natural Killer cells (NK cells) higher than stigmasterol and bis (2-ethylhexyl) phthalate. Increasing the dose given also increases the effect on the immunostimulant effect of each isolate. In the results of Cluster of Differentiation 8 + T (CD8 + T) showed the highest concentration at a dose of 100 Mg / kgbb on stigmasterol isolate (7). Determination of total flavonoid content was carried out by UV-Vis spectrophotometry using the collometric method with AlCl₃ complex reagent and antioxidant activity test of sungkai leaf extract determined by DPPH (2,2-diphenyl-1-picrylhydrazyl) method showed total flavonoid content of ethanol extract of *Peronema canescens* Jack leaves of 1,057 ± 0.002 mg EK/g extract and has antioxidant activity with IC₅₀ value of 44,933 ppm so that it is included in the category of highly active antioxidants (8).

Another study also highlighted the antihyperuricemia activity of sungkai extract through a decrease in blood uric acid levels in rats. This extract was also reported to show antibacterial activity against the growth of *E. coli* (9,10).

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-hexan 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 (11).

Sungkai plant (*Peronema canescens* Jack) is one of the medicinal plants that has been widely used as medicine such as medicine for malaria, antiparasitism, 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 (12).

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 cyclooxygenase 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 (13).

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. METHODOLOGY

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 "*Peronema canescens* plant isolate" or "efficacy of sungkai leaf isolate" 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.

III. DISCUSSION

The use of traditional medicine has been recognized long before the existence of formal health services by considering its benefits empirically. Today, herbal medicine is used as a complement to primary treatment. In the last decade, many have turned to traditional medicine products and practices with the assumption that natural means safe, which is not necessarily true. All effective drugs can cause adverse reactions, including herbal medicines. For this reason, in the use of herbal medicine, it is important to consider the dose, time of use, method of use, and selection of drugs for the disease suffered (14).

There was an effect of dose variation and duration of administration of ethanol extract of sungkai leaves on the histology of kidneys, with increased kidney histology damage. The highest increase occurred at 21 days of administration at a dose of 560 mg/kg bw. The study concluded that there is a need for caution in the prolonged use of sungkai leaf extract, especially at a dose of 560 mg/kg bw and beyond (1).

The ethanol fraction of Sungkai leaves is proven to be able to inhibit the growth of *Plasmodium berghei* parasites in the red blood cells of male white mice, where at a dose of 0.084 g / kgbw has the greatest percentage of inhibition compared to other treatment groups, reaching 54.06%. It can be concluded that the ethanol fraction of Sungkai leaves at a dose of 0.084 g / kgbw is the most effective dose and can have potential as an antimalarial. The results showed that the ethanol fraction of Sungkai leaves has the ability to inhibit the growth of *Plasmodium berghei* parasites in the blood of male white mice better than the synthetic drug chloroquine (12).

The antiplasmodium activity test of the n-hexane fraction of Sungkai leaves against male white mice showed a decrease in the number of parasitemia in male white mice infected with *Plasmodium berghei*. At a dose of 0.084 g / kgbb has an average value of a more significant decrease compared to doses of 0.028 and 0.056 g / kgbb. This shows that there is a relationship between increasing the dose of the n-hexane fraction of Sungkai leaves on the decrease in % paracetemia of male *M. musculus* directly proportional to the increase in sample dose (12).

Different doses of ethanol leaf extract of *Peronema canescens* have been shown to increase the number of ovarian follicles, corpus luteum, and ovulation rates of both ovaries of female Wistar mice (*Mus musculus* L.). This increase was optimal at an oral dose of 200 mg/kg bw. The study concludes that the leaf extract of *Peronema canescens* is a potential natural product that could be used in treating female infertility (2).

The results also showed no significant effect of dose variation and duration of administration of ethanol extract of sungkai leaves (*Peronema canescens* Jack.) on SGOT and SGPT levels in experimental animals, and sungkai leaf extract is safe to be given orally (15).

IV. CONCLUSIONS

Based on the literature that has been collected, it can be concluded that there are many studies on sungkai leaf extracts that are effective in maintaining endurance and have proven safety.

ACKNOWLEDGMENTS

Thank you to the lecturers and educational staff of the Faculty of Pharmacy and Faculty of Medicine, Andalas University and all those involved directly or indirectly in helping, guiding and providing ideas and ideas to the author in completing this literature review.

REFERENCES

- [1]. Dillasamola D, Fitria N, Husni E, Aldi Y. Subacute Toxicity Test of Ethanol Extract of Sungkai Leaves (*Peronema canescens* Jack.) on Renal Histology of Male Wistar Rats. *Trop J Nat Prod Res.* 2023;7:5519–22.
- [2]. Syofyan S, Almahdy A, Wulandari A, Alen Y, Diliarosta S, Kurniawan H, et al. Effects of Ethanol Extract of Sungkai (*Peronema canescens* Jack.) on Fertility of Female Wistar Mice (*Mus musculus* L.). *Trop J Nat Prod Res.* 2023;7(5):2863–6.
- [3]. Dillasamola, D, Fitria, N, Husni, E, & Aldi, Y. Subacute Toxicity Test of Ethanol Extract of Sungkai Leaves (*Peronema canescens* Jack.) on Renal Histology of Male Wistar Rats. *Trop J Nat Prod Res*, December 2023; 7(12):5519-5522.
- [4]. Pindan NP, Daniel, Saleh C, Magdaleni AR. Uji Fitokimia Dan Uji Aktivitas Antioksidan Ekstrak Fraksi N-Heksana, Etil Asetat Dan Etanol Sisa Dari Daun Sungkai (*Peronema canescens* Jack.) Dengan Metode DPPH. *J At.* 2021;6(1):22–7.
- [5]. Ibrahim A, Utami IW, Agustina R. Aktivitas Sediaan Gel Antiseptik Tangan Berbahan Aktif Ekstrak Fraksi Etanol Daun Sungkai (*Peronema Canescens* Jack.) terhadap Beberapa Bakteri Patogen. *J Trop Pharm Chem.* 2015 Dec;3(2):94–100.
- [6]. Andriani F, Sundaryono A, Nurhamidah N. Uji Aktivitas Antiplasmodium Ekstrak Daun *Peronema canescens* terhadap *Mus musculus*. *Alotrop.* 2017 Aug;1(1).
- [7]. Dillasamola, D., Wahyuni, F.S., Rita, R.S., Aldi, Y. Immunostimulating Activity of Sungkai Leaf Stigmasterol Isolate Against Cluster Differentiated 8+T (CD8+T) from Covid 19 Disease Exposure. *Pharmacogn J.* 2023; 15(5):738–742.
- [8]. MD, S. Penetapan Kadar Flavonoid Total dan Uji Aktivitas Antioksidan Ekstrak Etanol Daun Sungkai (*Peronema canescens* Jack) Asal Kalimantan Selatan. 2017.
- [9]. Fransisca D, Kahanjak DN, Frhernety A. Test of the antibacterial activity of ethanol extract of sungkai leaves (*Peronema canescens* Jack) on the growth of *Escherichia coli* using the Kirby-Bauer disk diffusion method. *JPLB.* 2020;4(1):460–70.
- [10]. Elfita, Oktiansyah R, Mardiyanto, Widjajanti H, Setiawan A. Antibacterial and antioxidant activity of endophytic fungi isolated from *Peronema canescens* leaves. *Biodiversitas.* 2022;23(9):4783–92.
- [11]. Yani, Ariefa P, Ruyani A, Ansyori I, Irwanto R. Uji Potensi Daun Mudah Sungkai (*Peronema canescens*) untuk Kesehatan (Imunitas) pada Mencit (*Mus. mucus*). *Semin Nas XI Pendidik Biol FKIP UNS* 245. 2014;245–50.
- [12]. Prasiwi D, Sundaryono A, Handayani D. Aktivitas Fraksi Etanol dari Ekstrak Daun *Peronema canescens* terhadap Tingkat Pertumbuhan *Plasmodium berghei*. *Alotrop.* 2018 May;2(1).
- [13]. Okfrianti Y, Irmameria D, Bertalina B. Aktivitas Antioksidan Ekstrak Etanol Daun Sungkai (*Peronema canescens* Jack). *J Kesehatan.* 2022;13(2):333.
- [14]. Dillasamola D, Aldi Y, Wahyuni FS, Rita RS, Dachriyanus, Umar S, et al. Study of Sungkai (*Peronema canescens*, Jack) leaf extract activity as an immunostimulators with in vivo and in vitro methods. *Pharmacogn J.* 2021;13(6):1397–407.
- [15]. Husni E, Dillasamola D, Jannah M. Subacute Toxicity Test of Ethanol Extract of Sungkai Leaf (*Peronema Canescens* Jack.) on Sgot and Sgpt Levels. *Trop J Nat Prod Res.* 2023;7(11):5046–9.