Jurnal Hurriah: Jurnal Evaluasi Pendidikan dan Penelitian
Hurriah Journal: Journal of Educational Evaluation and Research
Volume 7, No. 1 (2026) PP 84-93

Jurnal Hurriah: Jurnal Evaluasi Pendidikan dan Penelitian
Hurriah Journal: of Educational Evaluation and Research

Journal homepage: https://academicareview.com/index.php/jh
E-ISSN: 2774-8472 I P-ISSN: 2774-8480 I DOI : 10.56806

The Potency of Capa Plant (*Blumea balsamifera* L.) as a Source of Wound Medicine: Systematic Review

Khalisah[1], Masyudi[2, 3**], Saudah[4], Jailani[5], Irhamni [6]

[1] Master of Biology Education, Universitas Serambi Mekkah, Banda Aceh 23245, Indonesia
[2] Department of Natural Resources and Environmental Management, Universitas Serambi Mekkah, Banda Aceh 23245, Indonesia
[3] Department of Public Health, Universitas Serambi Mekkah, Banda Aceh 23111, Indonesia
[4] Master of Biology Education, Universitas Serambi Mekkah, Banda Aceh 23245, Indonesia
[5] Department of Biology, Universitas Serambi Mekkah. Banda Aceh 23245, Indonesia
[6] Department of Environmental Engineering, Faculty of Infrastructure and Regional Technology, Institut Teknologi Sumatera, Lampung Selatan, 35365, Indonesia.

ARTICLE INFO

Article history:

Received: December, 2025
Received in revised from: January, 2026
Accepted: February, 2026
Available online: March, 28, 2026

Keywords: capa plant, Blumea balsamifera, wound care, systematic review

ABSTRACT

Blumea balsamifera L., commonly referred to as CAPA, has been traditionally employed by people in Aceh for medicinal purposes, especially in wound treatment, where its leaves are typically processed to extract juice, which is then directly applied to the affected area. Prior research suggests that the overuse of chemical wound treatments can lead to negative outcomes, including allergic reactions, dermal dryness, and protracted healing, whereas the World Health Organization advocates for the utilisation of traditional medicine, encompassing herbal remedies, for the preservation of public health. This study examines the efficacy of Blumea balsamifera L. as a wound healing agent and assesses its viability for formulation into a gel-based topical application. A literature review was performed utilising 100 scientific papers pertaining to its therapeutic applications, with an emphasis on studies explicitly addressing wound healing, sourced from indexed international journals and SINTA-accredited national journals. The results indicate that Blumea balsamifera L. has antibacterial and anti-inflammatory characteristics, showing significant promise for formulation into a gel that facilitates efficient drug delivery and preserves ideal wound moisture levels. This plant signifies a promising natural alternative for wound treatment, and its transformation into a gel-based formulation provides a safe, practical, and effective method consistent with contemporary wound management concepts, while also promoting the use of traditional medicinal resources.

1. Introduction

Plant spices are still widely used as medicinal ingredients by people in Indonesia, especially in rural or inland areas, because they are easy to obtain, easy to use, and cheap. The healing effect provided in the treatment is quite satisfactory. Nutritious plants that provide medicinal

* Corresponding author.
E-mail address: masyudi@serambimekkah.ac.id
https://doi.org/10.56806// jh.v7i1.399

effects are often called herbal medicines or traditional medicines by the community(World Health Organization (WHO), 2013)

The Community in Aceh have long ago used the capa plant (*Blumea balsamifera L*.) as a plant that has medicinal properties. In some rural villages in South of Aceh traditional midwives use capa leaves mixed with turmeric then squeezed and drunk as one of the ingredients given to postpartum mothers for healing internal wounds (Masyudi & Usman, 2019),(BPS Aceh Selatan, 2016). In addition, fresh capa leaves affixed to the injured skin area are also able to heal wounds(Nuryadin, 2017).

Wound care has developed rapidly and is supported by advances in health technology. Wounds are sometimes accompanied by degenerative conditions and metabolic disorders. These conditions usually require proper treatment so that the healing process can be optimal (Kartika, 2015).

Treatment with dry wound conditions can actually prolong wound healing, because dry conditions cause cell proliferation and collagen, but wounds that are too wet will also cause maceration of the skin around the wound so that maintaining balanced moisture is the focus of wound healing(Raghow Rajendra, 2018).

Wounds with a moist environment can accelerate fibrinolysis, angiogenesis, reduce the risk of infection, increase growth factor formation and active cell formation (Kartika, 2015).

Treatment of wounds using chemical drugs topically has many side effects that may inhibit wound healing, namely skin irritation, allergic reactions (skin redness, itching, and swelling). As an alternative, people can choose to use medicinal plants(Indah Imamah, 2017). The World Health Organization (WHO) in the book Traditional Medicine Strategy 2014-2023 also recommends the use of traditional medicines including herbal public health maintenance(World Health Organization (WHO), 2013).

Blumea balsamifera L. reduces PEG-2 and protein transudation. Extract *Blumea balsamifera L*. is also able to reduce inflammatory cytokines such as IL-1, IL-6, TNF-α(Huang YL et al., 2016)(Y et al., 2014)(Fan et al., 2015). *Blumea balsamifera L*. oil given by topically at a dose of 2000 mg / kg body weight on the skin of white rats did not cause allergic reactions and toxicity. In addition, extracts from the capa plant can accelerate blood clotting (Yan et al., 2015). Yan et al., (2015) reported that the extract of *Blumea balsamifera L*. also acts as an anti-inflammatory. Capa extract using water as a solvent at a dose of 92 mg / kg body weight can reduce *edema* by up to 6.4%. Ethanol extract of capa leaves with a concentration of 40%, 60%, 80% and 100% can inhibit the growth of Escherichia coli and Staphylococcus aureus bacteria. While Sakee, et al, (2011) found that capa extract also has the potential to have antimicrobial activity(Sakee et al., 2011). *Blumea balsamifera L*. extract at a dose of 2.5 g / kg body weight had a better effect on wound healing in the skin of white rats, almost equal to the positive control (Pang et al., 2017).

From the previous research, it is known that *Blumea balsamifera L* have an active substance to heal wounds, but the use of the *Blumea balsamifera L* as a wound medicine is still limited to extracts and oil, not yet in a practical preparation with good dosage accuracy so further studies are needed. The author is currently conducting research on the effectiveness of gel preparations containing the active ingredient of capa leaf extract for wound healing. The choice of gel is because the gel has properties that can retain skin moisture so that it supports the current principle of wound care, namely by maintaining balanced moisture. In addition, the *carbopol-based* gel preparation will easily bind the active substance in the extract, is clearer, and is practical to use.

2. Methodology

This article provides a thorough assessment of current research on Blumea balsamifera L. (CAPA) and its use as a wound healing agent, along with a proposed study strategy to evaluate the efficacy of its gel-based extract formulation. Initially, 100 scholarly publications were identified regarding the medicinal characteristics of Blumea balsamifera L.; from this collection, research especially examining its involvement in wound healing were rigorously selected and analysed. The chosen literature was obtained from esteemed indexed worldwide publications and SINTA-accredited national journals to guarantee quality and contextual pertinence. The paper expands on findings from these studies by proposing a preliminary research design for the formulation and assessment of CAPA leaf extract in gel form, highlighting its potential to augment therapeutic efficacy, enhance application practicality, and conform to modern methodologies in wound care management.

3. Result

This study investigates the efficacy of Blumea balsamifera L. extract gel for wound healing applications. CAPA leaves sourced from South Aceh Regency served as the principal raw material for the formulation of a gel-based pharmaceutical product. The research process commenced with the collecting, sorting, and desiccation of plant materials, succeeded by extraction utilising three distinct solvents to yield three separate extracts. Subsequently, these extracts were analysed for their chemical composition using Gas Chromatography–Mass Spectrometry and phytochemical screening to detect their secondary metabolite content pertinent to wound healing efficacy.

In the next stage, the *Blumea balsamifera L*. extract which has been checked for phytochemical content and GCMS is then made into a gel pharmaceutical dosage form. Gel was chosen because gel preparations have properties that can retain skin moisture so that it supports the current principle of wound care, namely maintaining balanced moisture. Determination of the concentration of capa leaf extract into capa leaf extract gel continued the research from (Pang et al., 2017) about the effect of *Blumea balsamifera L*. extract on wound healing in mice wounds modified with gel composition in this study Hidayanti dkk., (2015) About the formulation and optimization of the *carbopol* 940 gel base with various concentrations concluded that the carbopol 0.5% concentration was the best(Hidayanti, Utami Wahyu, Fadraersada, Jaka, dan Ibrahim, 2015). In this case, the gel base is expected not to affect the previously planned extract dose because the gel is expected to function as an agent that maintains the function of the drug. The modification resulted in various concentration formulations as presented in Table 1.

Gel that has been made is carried out a series of tests including pH test, spread ability test, viscosity test, homogeneity test, organoleptic test and irritation test. It was confirmed that ethical clearance had been obtained before application of the gel *Blumea balsamifera L*. extract to the wounds of experimental animals. The experimental animal used was a male white mouse (Rattus novergicus) with an age between 2-3 months and a body weight of 150 to 250 grams.

White rats were divided into 5 groups for each type of capa leaf extract gel with 6 rats in each group. After the experimental animal has been prepared with an adaptation period of 7 days, the experimental animal is shaved on the back with a diameter of 2.5 cm, then given ketamine xylazine anesthesia then treated by making an incision wound 2 cm long in the back area. The wound was then treated with capa leaf extract gel for 14 days and the wound healing was evaluated every day.

The evaluation of wound healing was carried out macroscopically by looking at the wound healing from the Department / Depth of the wound, exudate / fluid, wound size, inflammation, granulation and necrotic tissue. Microscopically, a histological examination will be carried out by taking tissue from the treated animal wounds and then examined under a microscope. In addition, the levels of Interleukin 2 (IL-2) from the blood of experimental animals will also be checked, this is done to determine whether capa leaf extract gel can increase IL-2 levels, because IL-2 is a growth factor in cells produced by Th 1 cells when there is stimulation. If the growth factor is high, it will accelerate cell and tissue growth so that it will accelerate wound healing.

3.1 Botany and Ecology

Blumea balsamifera L. is a shrub with a height of more than 4 meters, dark green upright round stems with a diameter of 3-5 cm, the top of the stem is thickly hairy and aromatic. Single leaf measuring 6-30 cm long and 1,5-12 cm wide oval, base and sharp edges, serrated loin, pinnate leaves and there are 2-3 additional leaves on the petiole. The surface of the upper leaves is a bit rough, while the undersides of the leaves are tight and smooth. The roots are taproot and milky white(Huang YL et al., 2016)(Kinho & Diah I.D.A., Supratman T., Harwiyaddin K., Yermias K., Syamsir S., 2011).

Botany Systematics of *Blumea balsamifera L*. is :

Kingdom	: *Plantae*
Subkingdom	: *Embryophyta*
Division	: *Spermatophyta*
Subdivision	: *Angiospermae*
Class	: *Dicotyledonae*
Order	: *Asterales*
Family	:*Asteraceae* (Compositae)
Genus	: *Blumea*
Species	: *Blumea balsamifera L*.

Fig.1 Capa plant (*Blumea Balsamifera*)

Blumea balsamifera L. is spread throughout Asia and has different names in society. In Indonesia itself is also different, as for the regional names of *Blumea Balsamifera* are: Capa (Aceh); *Sembung (Malaya); Sembung Utan (Sundanese), Kemandin (Madura), and in Java are*

named by several names: Sembung, Sembung Gontung, Sembung Mingsa, Sembung Gula, Sembung Kuwuk, Sembung Lelet, Sembung Legi, Ternate: mandikapu; Bali: sembung (BPOM RI, 2008). The name of this plant in parts of the world also varies, among others : Inggris: Ngai champora; China: ai na xiang (Huang YL et al., 2016) *Malaysia: sembong, sembuh, sembing, telinga kerbau, capu, sapu*(Noor Rain et al., 2007)*; Perancis: camphier; Kamboja: bai mat; Myanmar: poung-ma-theing; Thailand: kamphong, nat-yai; Filipina: lakadbulan, subsub;* (Huang YL et al., 2016).

3.2 Cultivation of Blumea balsamifera L.

In Indonesia, *Blumea balsamifera L*. is relatively not widely cultivated. but the cultivation of this plant is relatively easy. The stages of sembung cultivation are :

1. *Blumea balsamifera L*. nursery is propagated using seed or siwalan seeds (bassal cutting or root cutting). Water is given regularly but not too much. The seeds have a germination rate of 95% and decrease by 10% when stored for 12 months.
2. Selection of planting location. A good location is the soil that is slightly moist and not too dry and slightly open. Sembung is not very resistant to drought. Plots of land are made with a size of 0.5-10 m × 1-1.50 m(Agyare et al., 2016).
3. Planting After 2 weeks, the plants can be transplanted to a place that receives optimal sunlight. Watering is important to maintain soil moisture. The optimum temperature is 30 ^{0}C(Panyaphu et al., 2011)
4. Maintenance in the cultivation of *Blumea balsamifera L*. consists of weeding, fertilizing, and controlling pests. In general, *Blumea balsamifera L* requires a wedding. A good weeding process is to completely remove weeds, not just cut weeds. Pests that often attack *Blumea balsamifera L*. are Endophyllum blumea which can cause leaf shedding, Cercospora sp which attacks during the rainy season and causes orange spots on leaves, and Gloeosporium sp. which often results in anthracnose (Huang YL et al., 2016)

3.3 Chemical Components (Blumea Balsamifera L.)

The identification results of the phytochemical content of *Blumea balsamifera L*. showed more than 100 chemicals such as essential oils, flavonoids, alcohols, dihydroflavones, sterols, organic acids, monoterpenes, sesquiterpenes, triterpenes. Most existing studies examine flavonoids and essential oils which have both in vivo and in vitro bioactivity effects (Pang, Wang, Hu, et al., 2014). Balangcod et al., (2012) identify the phytochemical content of *Blumea balsamifera L*, namely alkaloids, treroids, tannins, and glycosides(Balangcod et al., 2012). While Isnawati (2016), reported the results of identifying the content of capa leaves from Malang, Tawangmangu, and Bogor, among others tanin, flavonoid, L-campor, borneol, caryophyllene, β-camphene, dan αhumulene(Isnawati A, 2016).

Blumea balsamifera L. essential oil is an oily yellow liquid with a unique aroma. Most of the essential oils of the capa plant are found in the leaves and branches(Yong-lin et al., 2016). Jiang et al., (2014) researched that there are 42 types of content in capa leaf essential oil that have antitumor and antioxidant effects(Pang, Wang, Fan, et al., 2014). These contents, among others caryophyllene (19.28%); 1,7,7-trimethyl-(1S-endo)bicyclo[2.2.1] heptan-2-ol (15.54%); caryophylleneoxide (11.20%); thujopsene (10.36%); 3-t-butyl-4-methoxyphenol methyl derivative (6.04%); guaiol (5.03%); 1,3,4,5,6,7 hexahydro-2,5,5-trimethyl-2H-2,4α-ethanonaphthalene (4.89%); decahydro-α, 4αtrimethyl-8-methylene- [2R-(2α, 4αα, 8αα)]-2-naphthalenemethanol (3.83%); 1α, 2,3,3α, 4,5,6,7 β-octahydro- 1,1,3α, 7-tetramethyl-[1αR-(1αα, 3αα, 7αβ)]-1H-cyclopropa [a] naphthalene (2.97%); 4,4-dimethyl-

tetracyclo[6.3.2.0(2,5).0(1,8)] tridecan-9-ol (2.54%); 2methoxy-3- (2-propenyl)-phenol (1.93); 1,1,4,8-tetramethyl- cis, cis, cis-4,7,10- cycloundecatriene (1.67%).

The flavonoid component is the main non-volatile component of *Blumea balsamifera L*. Huang et al., (2016) calculated the total flavonoids present in several parts of the *Blumea balsamifera L* and found that the most flavonoid components of sembung were in the leaves (2.94%), followed by stems (1.36%) and branches The part of the capa plant that is most often used for treatment is the leaves, traditionally the use of sembung leaves is as topical use medicine (Huang YL et al., 2016).

3.4 Blumea balsamifera L. AS A WOUND MEDICINE

1. Wang et al., (2013) found that the use of *Blumea balsamifera L*. oil on intact skin and wounds in white rats did not have acute toxicity. White mice given sembung oil at a dose of 2000 mg / kg for 24 hours did not find allergic reactions and acute toxicity. Wounds on white rats were found to have better healing than those that were not given *Blumea balsamifera L* oil(Wang et al., 2013).
2. Fresh *Blumea balsamifera L*. affixed to the injured skin area is also able to heal wounds (Wang et al., 2013).
3. *Blumea balsamifera L* can also reduce PEG-2 and protein transudation. *Blumea balsamifera L*. extract is also able to reduce inflammatory cytokines such as IL-1, IL-6, TNF-α (Y et al., 2014; Yan et al., 2015)(Fan et al., 2015).
4. *Blumea balsamifera L* oil preparations given topically at a dose of 2000 mg / kg body weight on the skin of white rats do not cause allergic reactions and toxicity. In addition, extracts from the capa plant can accelerate blood clotting (Fan et al., 2015; Huang YL et al., 2016).
5. Yan et al., (2015) reported that the extract of the *Blumea balsamifera L*. also functions as an anti-inflammatory. Capa extract using water as a solvent at a dose of 92 mg / kg body weight can reduce edema by up to 6.4%(Pang et al., 2017).
6. Katno et al., reported that ethanol extract of *Blumea balsamifera L*. with concentrations of 40%, 60%, 80% and 100% can inhibit the growth of Escherichia coli and Staphylococcus aureus bacteria with inhibition zones of 14-23 mm and 17-21 mm(Lee et al., 2012; Mag et al., 2014).
7. Sakee, et al, (2011) found that capa extract also has the potential to have antimicrobial activity(Sakee et al., 2011).
8. *Blumea balsamifera L*. extract at a dose of 2.5 g / kg body weight had a better effect on wound healing in the skin of white rats, almost equal to the positive control, and was followed by 2 doses below, namely 0.6 g / kg and 1.25 g / kg body weight (Pang et al., 2017).
9. The *Blumea balsamifera L*. oil 1/5 and BB oil 1/10 promoted capillary regeneration, blood circulation, collagen deposition, granular tissue formation, epithelial deposition, and wound contraction. The mechanism underlying the action might be related to induction of SP secretion, and the proliferation and differentiation of mesenchymal cells(Fujimoto et al., 1988).
10. Traditionally, people use capa *Blumea balsamifera L*. leaves for treatment of hemorrhoids, bruises, ulcers, skin inflammation, and itching, the use of capa leaves is an external medicine (Pang, Wang, Hu, et al., 2014).

4. DISCUSSIONS

Gel *Blumea balsamifera L*. extract is a combination of the active ingredients of *Blumea Balsamifera* extract with gel ingredients that cool and retain skin moisture. *Blumea Balsamifera* extract from previous studies has been shown to have anti-bacterial and anti-inflammatory properties that accelerate wound healing.

Initially authors collecting 100 articles about the Blumea balsamifera L. for several treatment, from those 100 articles, only articles that reviewed the CAPA (*Blumea balsamifera L*.) plant with their uses for wound healing, then the author discussed the author's initial research plan on the formulation and effectiveness of the extract gel for wound healing an modern wound healing treatment.

Modern wound dressing is a closed and moist wound care method that focuses on keeping wounds from becoming dehydrated and improving the wound healing process (Dhivya et al., 2015). Wounds with a moist environment can accelerate fibrinolysis, angiogenesis, reduce the risk of infection, increase the formation of growth factors and the formation of active cells(Nontji et al., 2015). The key concept to support the wound healing process is to maintain a balanced wound moisture that will facilitate cell growth and collagen proliferation (Gito & Rochmawati, 2018; Kartika, 2015).

Blumea balsamifera L. is empirically used by the community, especially in Aceh as a wound medicine. Its efficacy as a wound medicine has also been tested, testing as a wound medicine needs to be done further. This is necessary to obtain adequate drug preparations, therefore it is necessary to develop preparations in other forms such as gel preparations that are applied topically and have several advantages including being able to deliver drugs well, easily spread evenly when applied to the skin, gives a cold sensation, does not cause scars on the skin and retain moisture in the wound.

5. CONCLUSION.

Blumea balsamifera L. is extensively utilised by local communities, especially in Aceh, as a traditional treatment for wound healing, with its leaves frequently applied directly to damaged skin. Preliminary studies suggest its medicinal potential, encompassing antibacterial and anti-inflammatory capabilities; nevertheless, additional scientific research is required to confirm its efficacy using standardised and reliable methodologies. This validation is crucial for facilitating its transition from conventional use to evidence-based medicinal application. In this context, the advancement of more practical and clinically suitable dosage forms, such as gel-based formulations, is increasingly significant, as gels provide benefits including ease of application, enhanced stability, controlled drug release, and preservation of optimal wound moisture conditions. Progressing research on gel formulations of Blumea balsamifera L. extract is essential for improving its pharmacological efficacy and user appeal. If experimental results validate that the gel formulation exhibits substantial wound healing efficacy, subsequent research phases—such as clinical assessment, formulation refinement, and safety evaluation—would be necessary to enhance its applicability. Furthermore, the successful development of this plant-based pharmaceutical solution may provide significant economic consequences. The cultivation and sustainable use of Blumea balsamifera L. should be encouraged at the community level, especially in rural regions, to foster local economic development, enhance household income, and facilitate the amalgamation of traditional knowledge with contemporary pharmaceutical advancements.

ACKNOWLEDGMENTS

The author thanks to MIPA Laboratory at Universitas Serambi Mekkah and the Microbiology Laboratory at the Faculty of Mathematics and Natural Sciences, Universitas Syiah Kuala, are acknowledged with gratitude by the authors. This study was made possible thanks to the financial support of the Indonesian Ministry of Research, Technology, and Higher Education.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest.

REFERENCES

Agyare, C., Boakye, Y. D., Bekoe, E. O., Hensel, A., Dapaah, S. O., & Appiah, T. (2016). Review: African medicinal plants with wound healing properties. *Journal of Ethnopharmacology*, *177*, 85–100. https://doi.org/10.1016/j.jep.2015.11.008

Balangcod, T. D., Vallejo, V. L., Patacsil, M., Apostol, O., Marie, L., Laruan, V. A., Manuel, J., Cortez, S., & Gutierrez, R. M. (2012). *Phytochemical screening and Antibacterial activity of selected medicinal plants of Bayabas , Sablan , Benguet Province , Cordillera Administrative Region , Luzon , Philippines*. *11*(October), 580–585.

BPS Aceh Selatan. (2016). *Aceh Selatan dalam Data*. BPS Aceh Selatan.

Dhivya, S., Padma, V. V., & Santhini, E. (2015). Wound dressing - a review. *BioMedicine*, *5*(4), 24–28. https://doi.org/10.7603/s40

Fan, Z., Pang, Y., Wang, K., Yu, F., Wang, D., Yang, Q., Ma, Q., Li, X., Zou, J., Zhang, W., & Wu, L. (2015). Blumea balsamifera Oil for the Acceleration of Healing of Burn Injuries. *Molecules*, *1*, 17166–17179. https://doi.org/10.3390/molecules200917166

Fujimoto, Y., Soemartono, A., & Sumatra, M. (1988). sesquiterpenelactones from blumea balsamifera. *Pergamon Journals Ltd*, *27*(Scheme 1), 1109–1111.

Gito, G., & Rochmawati, E. (2018). Effectiveness of Modern Wound Dressing on the Growth of Staphylococcus Aureus Bacteria. *Jurnal Keperawatan*, *9*(2), 88. https://doi.org/10.22219/jk.v9i2.5160

Hidayanti, Utami Wahyu, Fadraersada, Jaka, dan Ibrahim, A. (2015). FORMULASI DAN OPTIMASI BASIS GEL CARBOPOL 940 DENGAN BERBAGAI VARIASI KONSENTRASI Utami Wahyu Hidayanti * , Jaka Fadraersada, Arsyik Ibrahim. *Prosiding Seminar Nasional Kefarmasian Ke-1*, 68–75.

Huang YL, ZG, Z., & YX, W. (2016). *Komponen flavanoid non volatile blumea balsamifera*. (April), 20–21.

Indah Imamah. (2017). Pengaruh Hidrogel Centalla Asiatica untuk Penyembuhan Luka Insisi. *Jurnal Ilmiah Sehat Bebaya*, *1*(2), 125–131.

Isnawati A. (2016). , 2006. Standarisasi Simplisia dan Ekstrak Etanol Daun Sembung (Blumea balsamifera (L)) dari Tiga Tempat Tumbuh.pdf. *Media Litbang Kesehatan*.

Kartika, R. W. (2015). Perawatan Luka Kronis dengan Modern Dressing. *Jurnal Perawatan Luka*, *42*(7), 546–550.

Kinho, J., & Diah I.D.A., Supratman T., Harwiyaddin K., Yermias K., Syamsir S., M. C. K. (2011). *Tumbuhan Obat Tradisional Di Sulawesi Utara Jilid I Julianus Kinho Diah Irawati Dwi Arini Supratman Tabba Harwiyaddin Kama Yermias Kafiar Syamsir Shabri*.

Lee, D. G., Mok, S., Choi, C., Cho, E. J., Kim, H. Y., & Lee, S. (2012). *Analysis of apigenin in Blumea balsamifera Linn DC . and its inhibitory activity against aldose reductase in rat lens*. *1*(1), 28–33.

Mag, P., Jiang, Z., Zhou, Y., Ge, W., & Yuan, K. (2014). *Phytochemical compositions of volatile oil from Blumea balsamifera and their biological activities*. *10*(39). https://doi.org/10.4103/0973-1296.137377

Masyudi, & Usman, S. (2019). Creating Synergy between Village Midwives and Traditional Midwives : To Reduce the Mortality Rate of Mothers and Babies : In the Central Kluet Sub-District Health Centre in South Aceh Creating Synergy between Village Midwives and Traditional Midwives : To. *Journal of Physics: Conference Series*, *1232*. https://doi.org/10.1088/1742-6596/1232/1/012051

Nontji, W., Hariati, S., & Arafat, R. (2015). Teknik perawatan luka modern dan konvensional terhadap kadar interleukin 1 dan interleukin 6 pada pasien luka diabetik. *Jurnal Ners*, *10*(1), 133–137.

Noor Rain, A., Khozirah, S., Mohd Ridzuan, M. A., Ong, B. K., Rohaya, C., Rosilawati, M., Hamdino, I., Badrul, A., & Zakiah, I. (2007). Antiplasmodial properties of some Malaysian medicinal plants. *Tropical Biomedicine*, *24*(1), 29–35.

Nuryadin, M. (2017). *Formulasi dan uji penyembuhan luka gel sembung rambat*.

Pang, Y., Wang, D., Fan, Z., Chen, X., Yu, F., Hu, X., & Wang, K. (2014). *-A fitokimia dan Farmakologi Ulasan*. 9453–9477.

Pang, Y., Wang, D., Hu, X., Wang, H., Fu, W., Fan, Z., Chen, X., & Yu, F. (2014). EXPERIMENTAL STUDY Effect of volatile oil from Blumea Balsamifera (L .) DC . leaves on wound healing in mice. *Journal of Traditional Chinese Medicine*, *34*(6), 716–724. https://doi.org/10.1016/S0254-6272(15)30087-X

Pang, Y., Zhang, Y., Huang, L., Xu, L., Wang, K., & Wang, D. (2017). Effects and Mechanisms of Total Flavonoids from Blumea balsamifera (L .) DC . on Skin Wound in Rats. *International Journal of Moleculer Science*, 1–12. https://doi.org/10.3390/ijms18122766

Panyaphu, K., Van On, T., Sirisa-Ard, P., Srisa-Nga, P., Chansakaow, S., & Nathakarnkitkul, S. (2011). Medicinal plants of the Mien (Yao) in Northern Thailand and their potential value in the primary healthcare of postpartum women. *Journal of Ethnopharmacology*, *135*(2), 226–237. https://doi.org/10.1016/j.jep.2011.03.050

Raghow Rajendra. (2018). The role of extracellular matrix in post inflamatory wound healing and fibrosis. *Vaseb Jurnal*, 823–831.

Sakee, U., Maneerat, S., & Cushnie, T. P. T. (2011). Natural Product Research : Formerly Natural Product Letters Antimicrobial activity of Blumea balsamifera (Lin .) DC . extracts and essential oil. *Natural Product Research*, (December 2014), 37–41. https://doi.org/10.1080/14786419.2010.485573

Wang, Z., Wanjin, F., Yuxin, P., Hui, W., Xuan, H., & Hao, N. (2013). The Study of Skin Allergy and Acute Toxicity of Blumea Balsamifera Oil. *Chinese Journal of Tropical Crops*.

World Health Organization (WHO). (2013). WHO Traditional Medicine Strategy 2014-2023. In *World Health Organization (WHO)* (2013th ed., pp. 1–76). WHO. https://doi.org/2013

Y, X., J, Z., X, L., & JW, C. (2014). Anti-arthritic and anti-oxidative effect of ethyl acetate fraction of Blumea balsamlfera residues in rat adjuvant-induced arthritis. *Europe PMC*.

Yan, X., Xiang, L., & Jian-wei, C. (2015). Anti-inflammatory,Analgesic and Hemostasis Activities of Different Extracting Fractions of Blumea balsamifera Residue. *Natural Product Research and Development*.

Yong-lin, H., Zhi-guo, Z., & Yong-xin, W. (2016). Determination of total flavonoid in different sections of Blumea balsanifera. *CNKI*.