

CHAPTER I

INTRODUCTION

1.1 Background

The incidence of acute and chronic wounds increases every year. Work and daily activities often cause mistakes and skin injuries. Burns are a global health problem that causes around 180,000 deaths every year. Burns occur when some or all skin cells or other organic tissue are destroyed by hot liquids, hot solids, or fire (flame).¹ Other causes of burns include contact or exposure to hot objects, sunlight, radiation, chemicals, and electricity. As a result, the skin becomes vulnerable to infection because it resists foreign objects that cause wounds.²

The unwanted effects include fluid loss, infection, scar tissue development, hypothermia, respiratory issues, and limited joint movement. Chemical medications available for purchase can be used to treat burns. Some chemical medicine have undesirable effects, such as hypersensitivity and allergies. Therefore, alternative medicine are necessary, including developing medicines from nature or herbs.³

Data from 2010 to 2018 indicates that 44.3% of people used herbal or traditional medicine, which is increasing. The data shows that people are interested in using conventional medicine for health purposes. Indonesia has a variety of biodiversity that can be used as herbal medicine. Bidara laut leaves (*Ziziphus mauritiana* L) are herbal plants that contain alkaloids, glycosides, saponins, flavonoids, terpenoids and phenolics, which function as antioxidants, anti-inflammatory, antimicrobial and antifungal, as well as to prevent tumour growth.⁴ The use of bidara laut leaves (*Ziziphus mauritiana* L) has been proven to help incised wounds heal.⁵ Compounds

¹ Pratama, Putra, And Puspaningrat, "Formulasi Krim Ekstrak Daun Kelor (*Moringa Oleifera* Lam) Sebagai Penyembuhan Luka Bakar Pada Tikus Putih Jantan (*Rattus Norvegicus*)."

² Usman, "Effectiveness of Bidara Leaf Extract (*Zizipus Mauritiana* L.) on Skin Due to Burns in Various Variants of Extract Concentration Against Rabbit (*Oryctolagus Cuniculus* L.) Test Animals."

³ Endriyanto Et Al., "Formulasi Gel Ekstrak Daun Binahong (*Anredera Cordifolia* (Ten.) Steenis) Dengan Basis HPMC Serta Uji Penyembuhan Luka Bakar Pada Kelinci."

⁴ Elisia Herman Ratu Zahra, Sri Harsodjo, dan Maifritrianti, "Aktivitas Penyembuhan Luka Bakar Fraksi Ekstrak Etanol 96% Daun," *Farmasains* 4, no. 1 (April 2017): 1–7.

⁵ Hasibuan and Hervina, "Ekstrak Daun Bidara Laut (*Ziziphus Mauritiana*) Efektif Terhadap Penyembuhan Luka Bakar Pada Tikus Putih (*Rattus Norvegicus* L.) Galur Wistar."

in bidara leaves can be isolated by extraction. Extraction is a process used to separate components in a solution by exploiting differences in solubility.⁶

People are uncomfortable using extracts directly because they do not understand the dosage. Therefore, extracts can be made into preparations, including a spray. The spray preparation does not involve any contact between the preparation and the user's skin, so its hygiene exceeds that of other pharmaceutical preparations such as ointments and creams.⁷

Treating wounds is one way to restore the skin to good condition, as Allah has said in the Al-Qu'an that skin that has been burned or damaged will be replaced with new skin in Surah An-Nisa, verse 56.

إِنَّ الَّذِينَ كَفَرُوا بِآيَاتِنَا سَوْفَ نُصْلِيهِمْ نَارًا كَلَّمًا نَضِجَتْ جُلُودُهُمْ بِدَلْنِهِمْ جُلُودًا
غَيْرَهَا لِيَذُوقُوا الْعَذَابَ إِنَّ اللَّهَ كَانَ عَزِيزًا حَكِيمًا ﴿٥٦﴾

Indeed, those who disbelieve in our verses will later be thrown into hell. Every time their skin was burnt, we replaced it with another skin so that they would feel (the pain of) punishment. Indeed, Allah is all-powerful, all-wise. (QS. An-Nisa': 56)⁸

1.2 Formulation of The Problem

The problem formulation in this research is as follows:

1. What are the results of evaluating the physical quality of the spray preparation of bidara laut leaf extract (*Ziziphus mauritiana*)?
2. How adequate is the spray preparation of bidara laut leaf extract (*Ziziphus mauritiana*) in accelerating the healing of burn wounds in white rats?

⁶ Ega Amelinda, I Wayan Rai Widarta, dan Luh Putu Trisna Darmayanti, "Pengaruh Waktu Maserasi Terhadap Aktivitas Antioksidan Ekstrak Rimpang Temulawak (*Curcuma Xanthorrhiza* Roxb.)," *Jurnal Ilmu dan Teknologi Pangan (ITEPA)* 7, no. 4 (17 Desember 2018): 165, <https://doi.org/10.24843/itepa.2018.v07.i04.p03>.

⁷ Ririn Putri Handayani, Jastria Pusmarani, dan Nur Hatidjah Awaliyah Halid, "Formulasi dan Uji Aktivitas Sediaan Deodoran Spray Ekstrak Daun Beluntas (*Pluchea indica*) Terhadap Bakteri *Staphylococcus epidermidis*," *Jurnal Pharmacia Mandala Wahya* 1, no. 1 (28 Februari 2022): 7–12, <https://doi.org/10.54883/jpmw.v1i1.46>.

⁸ Proyek Penggandaan Kitab Suci Al-Qur'an, *Al-Qur'an dan terjemahannya* (Departemen Agama Republik Indonesia, 1995).

3. What concentration of bidara laut leaf extract (*Ziziphus mauritiana*) spray preparation is most effective in accelerating the healing of burn wounds in white rats?

1.3 Research Purposes

The aim of this research is:

1. Know the results of the physical quality evaluation of the bidara laut leaf extract spray preparation (*Ziziphus mauritiana*).
2. To determine the effectiveness of bidara laut leaf extract preparations (*Ziziphus mauritiana*) in accelerating the healing of burn wounds in white rats.
3. To determine the concentration of the spray preparation of bidara laut leaf extract (*Ziziphus mauritiana*), which is most effective in accelerating the healing of burn wounds in white rats.

1.4 Benefits of research

1. Theoretical Benefits

The results of this research can be used as reference material for further research regarding the effectiveness of bidara leaves in healing wounds, especially burns.

2. Practical Benefits

It is hoped that the results of this research will add to the body of knowledge and increase the insight of readers, especially those who use bidara laut leaves, regarding the effect on healing burns.

1.5 Authenticity of Research

Previous researchers have researched the effect of bidara leaves, as seen in Table 1 below.

Table 1. Authenticity of research

Research Title	Research Methods	Variable	Result	Research Differences
Variable bidara laut leaf extract (<i>Ziziphus mauritiana</i>) is	Experimental	Independent: Bidara laut leaf extract Dependent:	Bidara leaf extract is effective in healing rat burns and does not	Independent: bidara leaf extract spray preparation

Research Title	Research Methods	Variable	Result	Research Differences
effective in healing burns in white rats (Rattus norvegicus L.) Wistar strain. ⁹		Comparing the effectiveness of bidara leaf extract and other treatment groups in healing burns	cause allergic reactions.	Dependent: Healing burns in Wistar white rats using a spray preparation of bidara leaf extract
The effectiveness of bidara leaf extract (Ziziphus mauritiana L.) on the skin caused by burns in various extract concentrations on rabbits (Oryctolagus cuniculus L.) test animals. ¹⁰	Experimental	Independent: Bidara laut leaf extract Dependent: comparing various variants of extract concentrations on rabbit test animals for burn wounds	Bidara leaf extract is effective in healing burns at a concentration of 4% based on the ANOVA test on the 21st day.	Independent: bidara leaf extract spray Dependent: healing burns using a spray preparation of bidara leaf extract

⁹ Hasibuan dan Hervina, "Ekstrak Daun Bidara Laut (Ziziphus mauritiana) Efektif terhadap Penyembuhan Luka Bakar pada Tikus Putih (Rattus norvegicus L.) Galur Wistar."

¹⁰ Usman, "Effectiveness of Bidara Leaf Extract (Zizipus Mauritiana L.) on Skin Due to Burns in Various Variants of Extract Concentration Against Rabbit (Oryctolagus cuniculus L.) Test Animals."