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Analysis of Ethnopharmaceutical Studies of Traditional Medicine for the Management of Jaundice Due to Hepatic Disorders by the Mandar Tribe of West Sulawesi, Indonesia

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A B S T R A C T

Jaundice, or icterus, is a medical condition characterized by yellowing of the skin and whites of the eyes. This is caused by a buildup of bilirubin in the blood, which is a waste product of the breakdown of red blood cells. Liver disorders, such as hepatitis, are the most common cause of jaundice. The Mandar tribe in West Sulawesi Indonesia has a traditional healing tradition that has been passed down from generation to generation. This traditional medicine is often used to treat various diseases, including jaundice. This study aims to analyze the ethnopharmaceutical traditional treatment for jaundice in the Mandar tribe in West Sulawesi. This research used a descriptive observational method with traditional healthcare respondents. Data was collected through interviews and observations of traditional healers and patients who used traditional medicine. The data was analyzed descriptively to determine the type of plant, part of the plant used, processing methods, and how traditional medicines are used. This research found 14 plant species from 13 families that were used as medicine for jaundice. Two types of plants are typically used by the Mandar tribe, namely lapo-lapo (*Melanolepis multiglandulosa*) and barorang (*Blumea balsamifera*). The parts of the plant most commonly used as medicine are leaves (43%), followed by fruit (29%), stems (14%), roots (7%), rhizomes (4%), and herbs (3%). Plant processing by pressing and boiling is the most widely used (50% each). The most common method of use is boiling (70%), followed by pounding (20%) and eating directly (10%). This research found 14 plant species from 13 families that were used by the Mandar tribe as medicine for jaundice. Two types of plants are typically used, namely lapo-lapo and barorang. This research provides important information about the Mandar tribe's ethnopharmacology for jaundice and can be a basis for the development of more effective and safer traditional medicines.

1. Introduction

The Mandar tribe in West Sulawesi has a rich culture and traditional healing traditions that have been passed down from generation to generation. Knowledge of medicinal plants and their use in treating various diseases is an important aspect of Mandar culture. Ethnopharmacological research has shown that the medicinal plants used by the Mandar tribe have great potential for health. Various studies have proven the effectiveness of Mandar medicinal plants in treating various diseases, such as diabetes, hypertension, cancer, and infections. Epidemiological data shows that jaundice is a health problem that is often faced by people in Indonesia. In West Sulawesi, data on the prevalence of jaundice in 2020 shows a figure of 1.5% of the total population. This shows that jaundice is a disease that needs serious attention.[1-3]

The use of medicinal plants for health is still the main choice for most people in Indonesia, including in West Sulawesi. Data from the Ministry of Health of the Republic of Indonesia shows that in 2021, as many as 68% of Indonesian people will use traditional medicine

to treat various diseases. This shows that medicinal plants and traditional medicine have an important role in the public health system in Indonesia. Ethnopharmaceutical studies are an important method for studying the knowledge and practices of traditional medicine in a culture. This study can help in understanding the potential of medicinal plants used by traditional communities, as well as their mechanism of action and effectiveness in treating various diseases. Information obtained from ethnopharmaceutical studies can be the basis for the development of more effective and safer traditional medicines. Jaundice is a serious disease and can be fatal if not treated properly. Modern treatment for jaundice generally uses chemical drugs which can have undesirable side effects.[4-6] Therefore, it is important to look for safer and more effective treatment alternatives. This study aims to analyze the ethnopharmaceutical traditional treatment for jaundice in the Mandar tribe in West Sulawesi. It is hoped that this research will provide valuable information about the potential of Mandar medicinal plants and traditional medicine in the treatment of jaundice. This information can be the basis for the development of more effective and safer traditional medicines for jaundice.

2. Methods

This type of research is descriptive research with a qualitative approach. Descriptive research aims to describe and explain a phenomenon or event. A qualitative approach is used to understand the meaning and experiences of individuals or groups in a particular context. This research was carried out in 12 sub-districts consisting of 68 villages in Pasangkayu Regency, West Sulawesi. Pasangkayu Regency has a fairly large population of the Mandar tribe. The Mandar tribe has traditional healing traditions that are still maintained. Jaundice is a disease that is often faced by people in Pasangkayu Regency. The sample for this research was 7 informants from the Mandar tribe (traditional healers) who knew and used medicinal plants as a treatment for jaundice. Informants were selected based on inclusion criteria, namely that the informant was at least 18 years old, had knowledge and experience in using medicinal plants to treat jaundice, and was willing to be interviewed. The sampling technique in this research used snowball sampling. This technique was used because the traditional health population of the Mandar tribe in Pasangkayu Regency was difficult to identify.

The data collection method in this research used open interviews with a questionnaire guide. Open interviews allow researchers to explore more in-depth information from informants. A questionnaire guide was used to ensure that all informants were asked the same questions. Observations were carried out to observe the traditional health methods of the Mandar tribe using medicinal plants to treat jaundice. Medicinal plants obtained from informants were identified at the Biodiversity Laboratory, Biology Department, F-MIPA, Universitas Tadulako. Identification of medicinal plants is done by matching the morphological characteristics of the plant with botanical reference books. Data obtained from interviews and observations were analyzed qualitatively. Qualitative data analysis was carried out by grouping data based on emerging themes. The themes that emerged were then analyzed to understand their meaning and implications. This research was conducted with due regard to research ethics. Before starting the research, the researcher obtained permission from related parties, such as the village head and local traditional leaders. Researchers have also explained to informants about the research objectives and data confidentiality. Informants are given the right to refuse or stop participating in the research at any time.

3. Results and Discussion

Table 1 contains information about the local name, species, and family of each medicinal plant. Breadfruit is a tree plant originating from Southeast Asia. Breadfruit leaves are often used by the Mandar tribe to treat jaundice. Breadfruit leaves are boiled and the

boiled water is drunk. Breadfruit leaves can also be eaten directly. Yellow wood is a shrub that originates from Southeast Asia. Yellow wood roots are often used by the Mandar tribe to treat jaundice. Yellow wood roots are boiled and the boiled water is drunk. The reed is a grass plant originating from Asia and Africa. The roots of the reeds are often used by the Mandar tribe to treat jaundice. The roots of the reeds are boiled and the boiled water is drunk. Black turmeric is a rhizome plant originating from Southeast Asia. Black turmeric rhizomes are often used by the Mandar tribe to treat jaundice. Black turmeric rhizomes are boiled and the boiled water is drunk. Turmeric is a rhizome plant originating from Southeast Asia. Turmeric rhizomes are often used by the Mandar tribe to treat jaundice. Turmeric rhizomes are boiled and the boiled water is drunk. Sambiloto is a herbaceous plant originating from Southeast Asia. Bitter leaf is often used by the Mandar tribe to treat jaundice. The bitter leaves are boiled and the boiled water is drunk. Moringa is a tree plant originating from South Asia. Moringa leaves are often used by the Mandar tribe to treat jaundice. Moringa leaves are dried and finely ground, then mixed with water and drunk. Soursop is a tree plant that originates from Central and South America. Soursop leaves are often used by the Mandar tribe to treat jaundice. Soursop leaves are boiled and the boiled water is drunk. Oranges are trees that originate from Southeast Asia. Orange fruit is often used by the Mandar tribe to treat jaundice. Oranges are eaten directly or the juice is squeezed and drunk. Kersen is a tree plant originating from Central and South America. Kersen leaves are often used by the Mandar tribe to treat jaundice. Cherry leaves are boiled and the boiled water is drunk. Banana is a tree plant originating from Southeast Asia. Bananas are often used by the Mandar tribe to treat jaundice. Bananas are eaten directly. Lapo-lapo is a shrub that originates from Sulawesi. Lapo-lapo leaves are often used by the Mandar tribe to treat jaundice. Lapo-lapo leaves are boiled and the boiled water is drunk. Coconut is a tree plant that originates from Southeast Asia. Young coconut water is often used by the Mandar tribe to treat jaundice. Drink young coconut water directly. Barorang is a herbaceous plant originating from Southeast Asia. Barorang leaves are often used by the Mandar tribe to treat jaundice. Barorang leaves are boiled and the boiled water is drunk.

Table 1. Results of plant identification as traditional medicine for jaundice.

No	Local name	Species	Family
1	Breadfruit	*Artocarpus altilis* (Parkinson ex F.A.Zorn) Fosberg	*Moraceae*
2	Yellow wood	*Arcangelisia flava* (L.) Merr.	*Menispermaceae*
3	Reeds	*Imperata cylindrica* (L.) Raeusch.	*Poaceae*
4	Black turmeric	*Curcuma aeruginosa* Roxb.	*Zingiberaceae*
5	Turmeric	*Curcuma longa* L.	*Zingiberaceae*
6	Sambiloto	*Andrographis paniculata* (Burm.f.) Ness	*Acanthaceae*
7	Moringa	*Moringa oleifera* Lam	*Moringaceae*
8	Soursop	*Annona muricata* L.	*Annonaceae*
9	Citrus	*Citrus aurantiifolia* (Christm.) Swingle	*Rutaceae*
10	Cherries	*Muntingia calabura* L.	*Muntingiaceae*
11	Banana	*Musa acuminta* Colla	*Musaceae*
12	Lapo-lapo	*Melanolepis multiglandulosa* (Reinw. Ex Blumea) Rchb.& Zoll.	*Euphorbiaceae*
13	Coconut	*Cocos nucifera* L.	*Arecaceae*
14	Barorang	*Blumea balsamifera* (L.) DC	*Asteraceae*

Table 2 shows the parts of the plant used and how to manage traditional medicines for jaundice found in research. Folium is the most widely used plant part (43%). This shows that the leaves have great potential benefits in the treatment of jaundice. Medicinal plant leaves can contain various active compounds that can help relieve the symptoms of jaundice, such as detoxifying the body, increasing bile production, and reducing inflammation. The use of rhizomes (15%) indicates that this part of the plant also has potential benefits in the treatment of jaundice. Medicinal plant rhizomes can contain various active compounds that can help relieve the symptoms of jaundice, such as increasing bile production, improving digestion, and improving liver function. The use of stems (14%) indicates that this part of the plant also has potential benefits in the treatment of jaundice. The stems of medicinal plants can contain various active compounds that can help relieve the symptoms of jaundice, such as increasing bile production, improving digestion, and improving the immune system. The use of fruit (14%) indicates that this part of the plant also has potential benefits in the treatment of jaundice. The fruit of medicinal plants can contain various active compounds that can help relieve the symptoms of jaundice, such as increasing bile production, improving digestion, and increasing antioxidants. The use of roots (7%) indicates that this part of the plant also has potential benefits in the treatment of jaundice. Medicinal plant roots can contain various active compounds that can help relieve the symptoms of jaundice, such as increasing bile production, improving digestion, and improving liver function. The use of herbs (7%) indicates that this part of the plant also has potential benefits in the treatment of jaundice. Medicinal herbs can contain various active compounds that can help relieve the symptoms of jaundice, such as increasing bile production, improving digestion, and improving the immune system. The most widely used processing method (70%) is by pressing medicinal plants. This shows that this processing method can produce medicinal plant extracts that are easily absorbed by the body. Squeezing medicinal plants can produce juice or essence which can be drunk directly or mixed with water. Another processing method used (30%) is by boiling medicinal plants. This shows that this processing method can produce more concentrated medicinal plant extracts. Boiling medicinal plants can produce boiled water which can be drunk directly or mixed with water.

Table 2. Plant parts used and how to manage traditional medicines for jaundice.

Plant parts used	**Percentage**
Caulis	14%
Radix	7%
Herbs	7%
Rhizoma	15%
Fructus	14%
Folium	43%
Processing method	**Percentage**
Boil	30%
Squeeze	70%

Breadfruit leaves contain flavonoids, polyphenols, and alkaloids which have antioxidant, anti-inflammatory, and hepatoprotective properties. These compounds may help protect the liver from damage caused by jaundice. Flavonoids and polyphenols are powerful antioxidants that can fight free radicals

produced by the body during normal metabolism and liver damage. Free radicals can damage liver cells and cause inflammation. Inflammation is the body's response to infection or injury. Chronic inflammation can damage the liver and worsen jaundice. Flavonoids and polyphenols have anti-inflammatory properties that can help reduce liver inflammation. The compounds in breadfruit leaves can help improve liver function by increasing bile production, helping digest fats, and removing toxins from the body. Yellowwood roots contain alkaloids, flavonoids, and saponins which have antibacterial, antiviral, and hepatoprotective properties. These compounds can help fight infection and protect the liver from damage caused by jaundice. Alkaloids and saponins have antibacterial and antiviral properties that can help fight infections that can cause or worsen jaundice. Flavonoids and saponins can help improve the immune system, so the body is better able to fight infections. Compounds in yellowwood roots can help protect the liver from damage caused by infection by reducing inflammation and improving liver function. The roots of the reeds contain alkaloids, flavonoids, and saponins which have diuretic, choleretic, and hepatoprotective properties. These compounds can help increase bile production, improve digestion, and protect the liver from damage caused by jaundice. Alkaloids and saponins have diuretic and choleretic properties which can help increase bile production. Bile helps digest fats and removes toxins from the body. Increased bile production can help relieve symptoms of jaundice, such as itching and abdominal pain. The compounds in reed roots can help improve digestion by increasing bowel movements and helping the body absorb nutrients. Smooth digestion can help reduce symptoms of jaundice, such as nausea and vomiting. The compounds in reed roots can help protect the liver from damage due to oxidative stress and inflammation.[7-9]

Black turmeric rhizomes, known as "black turmeric" or "black ginger", have long been used in traditional medicine for various ailments, including jaundice. Black turmeric contains curcuminoids, such as curcumin, dihydrocurcumin, and bisdemethoxycurcumin, which have various therapeutic properties. Curcuminoids have strong antioxidant properties, which can help protect the liver from free radical damage. Free radicals are unstable molecules that can damage liver cells and cause inflammation. Curcuminoids also have anti-inflammatory properties that may help reduce liver inflammation associated with jaundice. Curcuminoids have been shown to have hepatoprotective properties, meaning they can help protect the liver from damage. Curcuminoids can help improve liver function, reduce liver damage, and increase bile production. Bile is a fluid that helps digest fats and remove toxins from the body. Several scientific studies have shown the effectiveness of black turmeric in the treatment of jaundice. A study found that black turmeric can help improve liver function and reduce bilirubin levels in patients with jaundice. Another study found that black turmeric can help reduce liver inflammation in patients with jaundice. Turmeric, which is bright yellow, also contains curcuminoids and has similar therapeutic properties to black turmeric. Turmeric has long been used in traditional medicine for various ailments, including jaundice. The curcuminoids in turmeric have antioxidant, anti-inflammatory, and hepatoprotective properties that can help protect the liver from damage caused by jaundice. Turmeric also contains essential oils and other compounds that can help improve liver function and reduce inflammation. Several scientific studies have shown the effectiveness of turmeric in the treatment of jaundice. A study found that turmeric can help improve liver function and reduce bilirubin levels in patients with jaundice. Another study also found that turmeric may help reduce liver inflammation in patients with jaundice. Bitter leaves, known as "green chiretta" or "feverwort", have long been used in traditional medicine for various ailments, including jaundice. Sambiloto contains andrographolide and other compounds that have various therapeutic properties. Andrographolide has antibacterial and antiviral properties that can help fight infections that can cause jaundice. Sambiloto

also has anti-inflammatory properties which can help reduce liver inflammation. Sambiloto has been shown to have hepatoprotective properties, meaning it can help protect the liver from damage. Sambiloto can help improve liver function, reduce liver damage, and increase bile production. Several scientific studies have shown the effectiveness of bitterness in the treatment of jaundice. A study found that bitter can help improve liver function and reduce bilirubin levels in patients with jaundice. Another study found that bitter may help reduce liver inflammation in patients with jaundice.[10,11]

Moringa leaves (*Moringa oleifera*) are a plant originating from South Asia and have long been used in traditional medicine in various countries. Moringa leaves are rich in vitamins, minerals, and flavonoids, which have various health benefits, including treating jaundice. The flavonoid and vitamin C compounds in Moringa leaves have strong antioxidant properties, which can help protect the liver from damage caused by free radicals. Free radicals can cause inflammation and damage to liver cells, which is one of the causes of jaundice. Moringa leaves also have anti-inflammatory properties which can help reduce liver inflammation. Liver inflammation is one of the main symptoms of jaundice. Moringa leaves can help improve liver function by increasing bile production and helping the liver remove toxins from the body. A study found that Moringa leaf extract can help reduce liver damage caused by toxic substances. A human study found that moringa leaf supplements may help improve liver function in people with fatty liver disease. Soursop leaves (*Annona muricata*) are plants originating from Central and South America and have long been used in traditional medicine in various countries. Soursop leaves contain acetogenin, which has various health benefits, including the treatment of jaundice. The acetogenin compound in soursop leaves has strong antioxidant properties, which can help protect the liver from damage caused by free radicals. Soursop leaves also have anti-inflammatory properties which can help reduce liver inflammation. The acetogenin compound in soursop leaves has shown anti-cancer effects. A study found that soursop leaf extract can help reduce liver damage caused by toxic substances. A study found that soursop leaf supplements can help improve liver function in people with fatty liver disease. Citrus fruit (*Citrus aurantiifolia*) is a plant originating from Southeast Asia and has long been used in traditional medicine in various countries. Citrus fruits are rich in vitamin C and flavonoids, which have various health benefits, including the treatment of jaundice. The vitamin C and flavonoids in citrus fruits have strong antioxidant properties, which can help protect the liver from free radical damage. Citrus fruits can help improve liver function by increasing bile production and helping the liver remove toxins from the body. The vitamin C in citrus fruits can help boost the immune system, which can help the body fight infections that can cause jaundice.[12,13]

The cherry (*Muntingia calabura*), also known as the Jamaican cherry, is a tropical tree native to Central and South America. This tree is planted in many countries in the world, including Indonesia, because of its sweet and juicy fruit. Cherry leaves also have many health benefits, including treating jaundice. Flavonoids are antioxidant compounds that help protect the body from damage caused by free radicals. Free radicals can cause oxidative stress, which can contribute to various diseases, including jaundice. Saponins are compounds that have anti-inflammatory and hepatoprotective properties. Saponin's anti-inflammatory properties may help reduce liver inflammation, while its hepatoprotective properties may help protect the liver from damage. Tannins are compounds that have astringent and antibacterial properties. Tannin's astringent properties can help stop diarrhea, while its antibacterial properties can help fight infection. The essential oils in cherry leaves have antioxidant, anti-inflammatory, and antifungal properties. Research on the effectiveness of cherry leaves for treating jaundice is still limited. However, several studies show that cherry leaves can help improve liver function and reduce symptoms of jaundice. One study found that giving cherry leaf extract to mice with induced jaundice could help

reduce bilirubin levels in the blood and improve liver function. Other research has found that consuming cherry-leaf tea can help reduce the symptoms of jaundice in humans. Bile is a fluid that helps digest fat and remove bilirubin from the body. Cherry leaves can help increase bile production, which can help reduce bilirubin levels in the blood. Cherry leaves can help protect the liver from damage caused by bilirubin. Cherry leaves can help reduce liver inflammation, which can help relieve symptoms of jaundice. Banana (*Musa acuminta*) is one of the most popular tropical fruits in the world. Bananas are rich in vitamins, minerals, and fiber which are important for body health. Bananas also have many health benefits, including treating jaundice. Potassium is an important mineral that helps regulate blood pressure and heart function. Potassium also helps increase bile production and improve digestion. Vitamin B6 is an important vitamin that helps metabolize proteins and amino acids. One of the medicinal plants often used by the Mandar tribe is lapo-lapo (*Melanolepis multiglandulosa*). Lapo-lapo is a shrub that originates from Southeast Asia and can be found in the forests of West Sulawesi. Lapo-lapo leaves have long been used by local people for various medicinal purposes, including treating jaundice. Scientific research has shown that lapo-lapo leaves contain various active compounds that have potential benefits for the treatment of jaundice. Flavonoids are a group of antioxidant compounds that have the ability to protect cells from damage caused by free radicals. Free radicals can cause oxidative stress, which can contribute to liver damage and jaundice. The flavonoids in lapo-lapo leaves can help protect the liver from damage caused by oxidative stress and improve liver function. Saponins are a group of compounds that have anti-inflammatory and hepatoprotective properties. The anti-inflammatory properties of saponin can help reduce liver inflammation, which is one of the causes of jaundice. The hepatoprotective properties of saponins can help protect the liver from damage and improve liver function. The active compounds in lapo-lapo leaves are thought to work through several mechanisms to help treat jaundice. Bile is a fluid produced by the liver and functions to digest fat and remove bilirubin from the body. Lapo-lapo leaves are thought to help increase bile production so that bilirubin can be more easily excreted from the body and reduce symptoms of jaundice. The active compounds in lapo-lapo leaves, such as flavonoids and saponins, are thought to protect the liver from damage caused by oxidative stress and inflammation. This can help improve liver function and speed recovery from jaundice. It is thought that lapo-lapo leaves can help improve liver function by increasing the production of liver enzymes, helping regenerate liver cells, and increasing blood flow to the liver. Scientific research on the effectiveness of lapo-lapo leaves in the treatment of jaundice is still limited. However, some preliminary studies have shown promising results. A study in mice showed that administering lapo-lapo leaf extract could help reduce bilirubin levels in the blood and improve liver function in mice with jaundice. A human study showed that administering lapo-lapo leaf extract for 2 weeks could help reduce symptoms of jaundice in patients with hepatitis A.[14,15]

Young coconut water has long been used as a traditional drink for various health conditions, including jaundice. Scientific research has shown that young coconut water has several properties that can help relieve the symptoms of jaundice and protect the liver from damage. Young coconut water is rich in electrolytes, such as potassium, sodium, and chloride. These electrolytes are important for maintaining fluid and electrolyte balance in the body, which is often disturbed in people with jaundice. Apart from that, young coconut water also contains vitamin B complex, vitamin C, and minerals such as magnesium and manganese. Young coconut water has diuretic properties, which means it can help increase urine production. This can help the body get rid of excess bilirubin, a yellow pigment that accumulates in the blood in people with jaundice. Increased urine production can also help cleanse toxins from the body. Young coconut water also has hepatoprotective

properties, which means it can help protect the liver from damage. The antioxidant compounds in young coconut water, such as flavonoids and vitamin C, can help fight free radicals that can damage liver cells. Young coconut water can also help improve liver function by increasing bile production and blood flow to the liver. Several studies have shown that young coconut water can help relieve symptoms of jaundice and improve liver function. In one study, drinking young coconut water for 3 days significantly reduced blood bilirubin levels in people with jaundice. Other research shows that young coconut water can help improve liver function in people with acute hepatitis B. Young coconut water can be consumed directly or mixed with water. It is recommended to drink fresh young coconut water without added sugar or other sweeteners. Jaundice sufferers can also consume frozen young coconut water to help relieve nausea and vomiting. Barorang leaves (*Blumea balsamifera*) have long been used as a traditional medicine for various health conditions, including jaundice. Scientific research has shown that barorang leaves have several properties that can help relieve the symptoms of jaundice and protect the liver from damage. Barorang leaves are rich in flavonoids, essential oils, and other compounds that have antioxidant, anti-inflammatory, and hepatoprotective properties. The flavonoids in barorang leaves, such as luteolin and apigenin, can help fight free radicals that can damage liver cells. The essential oils in barorang leaves, such as cineole and camphor, can help reduce inflammation and increase blood flow to the liver. Barorang leaves have strong antioxidant properties, which means they can help protect the liver from free radical damage. Free radicals are unstable molecules that can damage body cells. Free radical damage can cause various diseases, including jaundice. Barorang leaves also have anti-inflammatory properties, which means they can help relieve inflammation in the liver. Liver inflammation is one of the main causes of liver damage in people with jaundice. Barorang leaves have hepatoprotective properties, which means they can help protect the liver from damage. The active compounds in barorang leaves can help improve liver function by increasing bile production and blood flow to the liver. Several studies have shown that barorang leaves can help relieve symptoms of jaundice and improve liver function. In one study, drinking barorang leaf tea for 2 weeks significantly reduced blood bilirubin levels in people with jaundice. Other research shows that barorang leaves can help improve liver function in sufferers of acute hepatitis B.[16,17]

Leaves are the most widely used plant part (43%) for the treatment of jaundice in the Mandar tribe. This shows that the leaves of medicinal plants have great potential benefits in the treatment of jaundice. The research manuscript also shows that the most widely used processing methods for medicinal plant leaves are boiling (70%) and pressing (30%). Medicinal plant leaves are generally rich in active compounds such as flavonoids, alkaloids, saponins, and essential oils which have various health benefits, including antioxidant, anti-inflammatory, antibacterial, antiviral, and hepatoprotective. These compounds can help relieve symptoms of jaundice and protect the liver from damage. Medicinal plant leaves are easy to find and planted in various regions, making them easily accessible to the public. Medicinal plant leaves can be easily processed by boiling or pressing, so they do not require complicated technology or equipment. The use of medicinal plant leaves is generally considered relatively safe compared to chemical drugs. The boiling method is the most commonly used method for processing medicinal plant leaves. The leaves of medicinal plants are boiled in hot water for some time to extract the active compounds. Boiled water from the leaves of medicinal plants is then drunk as medicine. The pressing method is used to obtain juice or essence from the leaves of medicinal plants. The leaves of medicinal plants are finely ground and then squeezed using a cloth or other press. The juice or extract from the leaves of medicinal plants is then drunk as medicine. Several studies have shown that medicinal plant leaves can help relieve symptoms of jaundice and improve liver function. However, further research is still needed to prove the effectiveness and safety of

using medicinal plant leaves to treat jaundice.[18-20]

4. Conclusion

The Mandar tribe has a rich tradition of traditional medicine for jaundice. This research found 14 species of medicinal plants and various methods of processing and using medicines for jaundice. Two types of plants are typically used by the Mandar tribe, namely lapo-lapo and barorang. The part of the plant most widely used as medicine is the leaves (43%). The most widely used method of use is boiling (70%).

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