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Medicinal plants used by the community of Lipulalongo Village, Banggai Laut District, Central Sulawesi, Indonesia

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Abstract. *Haruna MF, Kenta AM, Herawati. 2022. Medicinal plants used by the community of Lipulalongo Village, Banggai Laut District, Central Sulawesi, Indonesia. Asian J Ethnobiol 5: 62-68.* Plants have been traditionally used for medicinal purposes to cure diseases or maintain body wellness and health. However, the utilization of medicinal plants by a particular community is unique and specific to the context of area, thus it might differ from one community to another. This study aimed to document the diversity of plant species used by the community in Lipulalongo Village, Labobo Sub-district, Banggai Laut District, Central Sulawesi, Indonesia, as well as to reveal the method of use of such plants in their medication practices. The research used a cruising survey method, and data collection used interviews, field observation, and identification. The study recorded 21 species of medicinal plants, namely *Phaleria macrocarpa* Boerl, *Andrographis paniculata* Burm.f., *Orthosiphon stamineus* Bent, *Coleus scutellarioides* (L.) Benth., *Averrhoa bilimbi* L., *Psidium guajava* L., *Capsicum annum* L., *Annona squamosa* L., *Syzygium aromaticum* (L.) Merr. & L.M.Perry, *Morinda citrifolia* L., *Gossypium arboreum* L., *Sesbania grandiflora* (L) Pers., *Cymbopogon citratus* (DC.) Stapf, *Curcuma domestica* Valeton, *Curcuma zedoria* (Christm.) Roscoe), *Areca catechu* L, *Alpinia galangal* (L.) Willd), *Carica papaya* L., *Theobroma cacao* L., *Chamaedaphne* sp., and *Blumea balsamifera* (L.) DC. The leaf was the most utilized plant organ rather than fruit, stem, bark, rhizomes, or tubers. Boiling and drinking was the most common method of preparation and mode of application, respectively. Diseases that can be prevented and treated using medicinal plants are fever, diarrhea, colds, coughs, sore teeth, skin diseases (e.g., boils, tinea versicolor, and ringworm), digestive tract diseases in the stomach, and therapy after giving birth.

Keywords: Banggai Laut, fruit, medicinal plants, rhizomes, tubers

INTRODUCTION

The environment cannot be separated from humans because it provides many benefits (Nurmayulis and Hermita 2015). One element of the environment that provides the most important uses for people plants. Throughout history and civilization, various plant species have been utilized and deliberately cultivated on human-modified landscapes (e.g., agricultural lands, yards, and home gardens) or wildly grown on natural ecosystems (e.g., forests). Besides the important role as a source of food and shelter materials, many plant diversity is also essential as a source of medicinal plants (Hadi et al. 2015). Medicinal plants are plants that can prevent, reduce or even eliminate diseases, regulate human body systems (such as blood circulation and respiratory system), and increase endurance and body fitness (Darsini 2013).

Medicinal plants have a strong relationship with traditional and indigenous practices because the use of plants for medication for a disease is not based on clinical trials in the laboratory but is generally originated and developed from the experience of people who have used them for decades, centuries or even millennia (Yuni et al. 2011; Az-Zahra et al. 2021). Traditional knowledge is based on ethnicity, cultural customs, or habits carried out by the local community. This custom is considered knowledge passed on from the ancestors to the next generation and has persisted for years.

In the modern era, as science and technology developed along with human civilization, many medicinal plants used in traditional practices have medicinal properties, such as anti-bacterial, anti-inflammatory, and so on. Nowadays, despite the extensive uses of chemical drugs, the utilization of medicinal plants is still prevalent along with the increasing level of welfare, awareness, and need for a healthy life, or so-called the paradigm of back to nature. In this regard, plants used for medicinal purposes are internationally known as herbal medicine (Indriati 2014). Various parts of medicinal plants are used for medication, such as root parts, bark, leaf, flowers, and even fruit and seeds.

The community of Lipulalongo Village, Labobo Sub-district, Banggai Laut District, Central Sulawesi, is one example of people in Indonesia who still use medicinal plants as traditional medicine. The indigenous tribes in Lipulalongo Village have traditional knowledge inherited from their ancestors regarding various types of biodiversity, which strongly relate to the culture of the community. Regarding the use of plants for medication, this practice is supported by the potential of natural resources in the form of various types of plants that grow in the area that have been utilized for generations. While the tacit knowledge of using plants for medicine by the Lipulalongo community is rich and extensive, the written documentation of such knowledge is lacking, if not absent. Therefore, this study aimed to document the diversity of

plant species used by the community in Lipulalongo Village, Labobo Sub-district, Banggai Laut District as well as to reveal the method of use of such plants in their medication practices.

MATERIALS AND METHODS

Study area

This research was conducted in August 2020 in Lipulalongo Village, Labobo Sub-district, Banggai Laut District, Central Sulawesi, Indonesia (Figure 1). Geographically, the village is located at 1°44'52.0"S 123°19'14.4"E. The village shares boundaries with Lalong Village to the north, Lipu-Talas Village to the south, Reason Village to the west, and Torpot Sea to the east. Lipulalongo Village has an area of about 18,000 ha with a total population of 1,040 people belonging to 312 households. The livelihoods of the people of Lipulalongo Village are mostly farmers and fishers.

Procedures

This study used a qualitative research method with data collected using surveys, interviews, and field observation. Data collection procedures were conducted as follows:

Step-1: Interview

Researchers provided open-ended interview questions in a structured manner. First, direct interviews were conducted with key informants who know traditional medication called *Sandro*. The questions in the interview were (i) the species of plants used for medicinal uses; (ii) the organ of plant being used; (iii) the disease or health problem to be cured; and (iv) the mode of application.

Step-2: Observation

Direct observation and collection of the samples of medicinal plants were conducted in the field with the guidance of *Sandro* by surveying the area in Lipulalongo Village.

Step-3: Identification

The medicinal plant samples were identified using references, including Practical Plant Identification by Cullen (2006), theplantlist.org, and the Encyclopedia of Flora and Steenis (2008).

Data analysis

The results of data collection were then analyzed using qualitative descriptive analysis. This study presents the results in tables and pictures of medicinal plant species along with the benefits and parts of plant organs used in medicine and traditional processing processes.

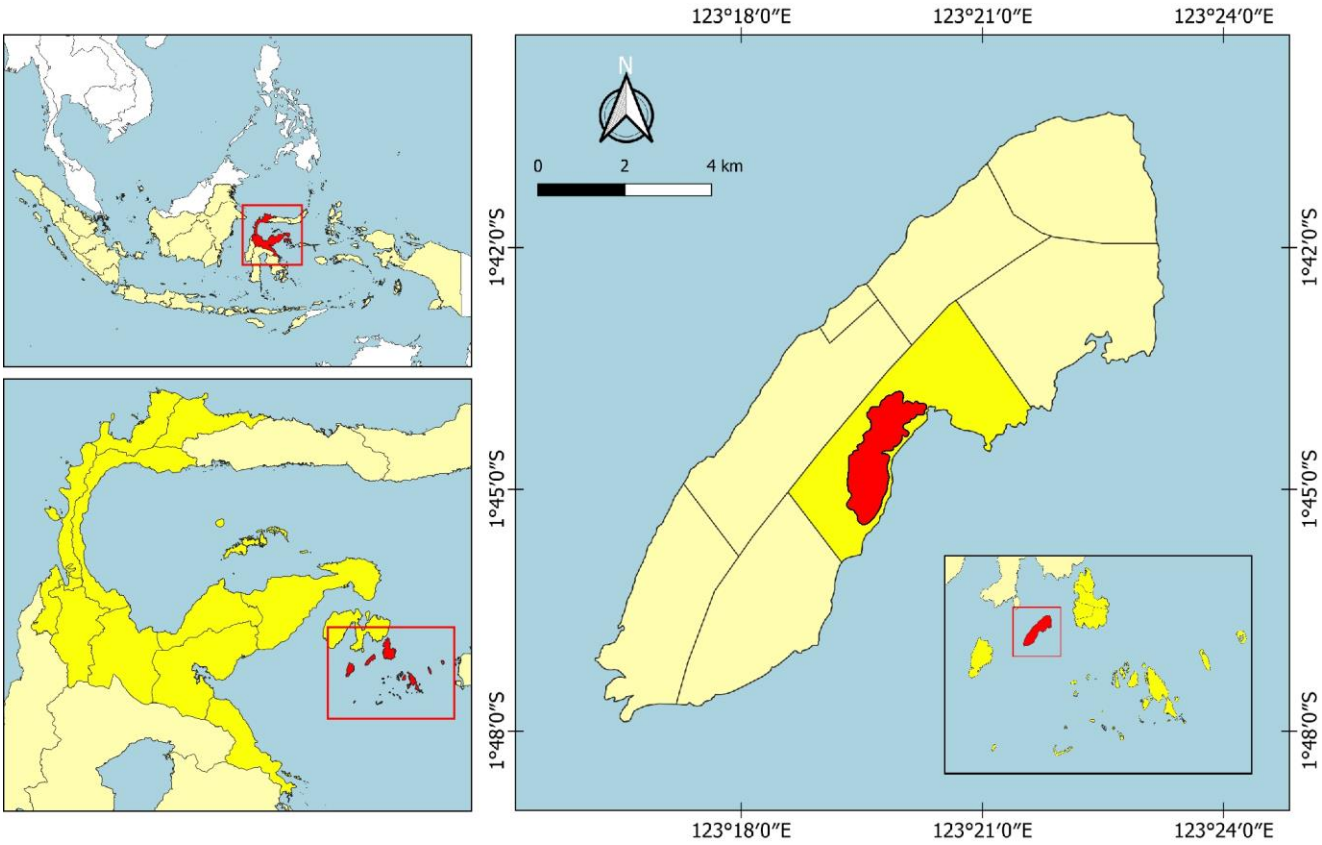

Figure 1. Location of the studied communities in the Labobo Sub-district, Banggai Laut District, Central Sulawesi, Indonesia. The location of villages sampled in the study area is Lipulalongo Village (red sign) (1°44'52.0"S 123°19'14.4"E)

RESULTS AND DISCUSSION

Based on observations and surveys of medicinal plants in Lipulalongo Village, Labobo Sub-district, Banggai Laut District, there are 21 species of medicinal plants used by local people in traditional medicine (Table 1, Figure 2). Of the various types of medicinal plants, all are plants that are simply cultivated by the community, and some of them are taken from the forest and then planted in the home garden.

The species of plants for medicinal uses in Lipulalongo Village can be found in the homegardens/yards, either growing naturally or deliberately planted. Some medicinal plants are also found in the gardens and forests around the village. However, the number of medicinal plant species used by the people of Lipulalongo Village (i.e., 21) is considered low. This is because people only get information about medicinal plants from generation to generation from their parents and *Sandro*. Therefore, it is necessary to conduct continuous research to develop qualitative and quantitative studies regarding the traditional knowledge of medicinal plants, which is also important to protect the local wisdom of the community as an intellectual collective of the Indonesian nation, as stated by Kandowangko et al. (2018).

The interview results also informed that the traditional medicines used by local people in Lipulalongo Village are inherited from their ancestors. However, not all families have the interest and ability to learn and know this, thus *Sandro* plays an important role in conserving traditional knowledge of medicinal plants. People use traditional medicinal plants because these are inexpensive and have minimal or no side effects if used correctly.

Part of the medicinal plants that the people of Lipulalongo Village widely use is a leaf. The leaf part of the plant is believed to have better benefits when compared to other parts. This is because the leaves contain compounds that have the potential to cure diseases, such as anti-inflammatory compounds, antioxidants, and other compounds, as well as they, have a soft fiber structure, so it is not difficult to obtain extracts of the compounds contained. In addition, the leaf is easy to obtain in a large quantity and does not highly affect the plant if harvested regularly compared to other organs. Also, the availability of the leaves is not affected by seasons if compared to, for example, flower or fruits. This is to the study by Akhsa et al. (2015), who stated that the use of leaves in traditional medication is easier to obtain, and the leaves are also easy to grow back, thus making it possible to be used continuously. A similar statement is also argued by Kandowangko et al. (2014), who stated that the use of the leaf organs of medicinal plants is an effort to conserve the preservation of medicinal plant species because it does not have a negative impact on the life of the plant. In some cases, the use of the leaves can be more effective if mixed with other plant parts such as root, stem, bark, rhizome, and tuber. However, using such organs as medicinal ingredients requires restrictions because they might immediately kill the plant. Besides the use of rhizome for medication, it is also used as natural spices for cooking, thus plants that are used for their rhizomes are obtained in the home garden to provide greater availability.

The result of an interview with *Sandro* explained that medicinal plants could be used to treat various diseases and health problems such as fever, diarrhea, colds, coughs, sore teeth, skin diseases (e.g., ulcers, tinea versicolor, and ringworm), digestive tract diseases in the stomach and therapy after giving birth (post-partum). However, before using for medication, the medicinal plant must be processed first, combining a species with other plants. The most common processing method carried out by the people in the Lipulalongo village is boiling and then squeezing. Here are some examples of using plants to cure disease or treat health problems and how to process by the people of Lipulalongo Village.

Drugs for blood pressure disease

The people of Lipulalongo Village use starfruit leaves (*Averrhoa bilimbi* L.), srikaya leaves (*Annona squamosa* L.), and cocoa leaves (*Theobroma cacao* L.) to treat blood pressure. However, few leaves of such plants are boiled with water and drank once daily. A similar disease can be cured using the fruit of *Phaleria macrocarpa* Boerl by drying the fruit's skin, then brewing it with a glass of hot water and drinking it when it is warm. The *P. macrocarpa* is a medicinal plant that can be used as an alternative treatment that contains flavonoids and has few side effects. Abed (2020) explained that blood pressure disease generally increases slowly as humans age, making hypertension a critical illness for the elderly. The flavonoid compounds contained in *P. macrocarpa* are effective in lowering blood pressure.

Treating diabetes

The people of Lipulalongo Village use the srikaya leaf plant (*A. squamosa*) to treat diabetes by taking a few leaves, boiling them in water, and drinking a glass of it once a day. The results of research by Rahmawati and Islamiyati (2018) that used *A. squamosa* leaf extract can reduce glucose levels in mice because this plant has a compound with anti-diabetic properties. This is also supported by research by Davis et al. (2018), which stated that *A. squamosa* hexane extract for 21 days significantly increased the decrease in glucose and triglycerides. Sharma et al. (2018) stated that the efficacy of *A. squamosa* extract contains anti-diabetic compounds in nature due to the presence of various types of active phytochemicals so that it can control diabetes mellitus.

After giving birth (giving birth)

The people of Lipulalongo Village use cingkeh leaves (*Syzygium aromaticum* (L.) Merr. & L.M.Perry) and cocoa leaves (*T. cacao*) to enhance body wellness after giving birth. A similar finding was also found by Fuadi (2017) that the people of Krueng Kluat Village believe that using traditional medicinal plants after childbirth, one of which is *S. aromaticum*, can discharge puerperal blood, re-tighten the abdominal muscles, heal wounds uterus and vagina, as contraceptives, restore fitness and health to the mother's body post-partum and weight loss.

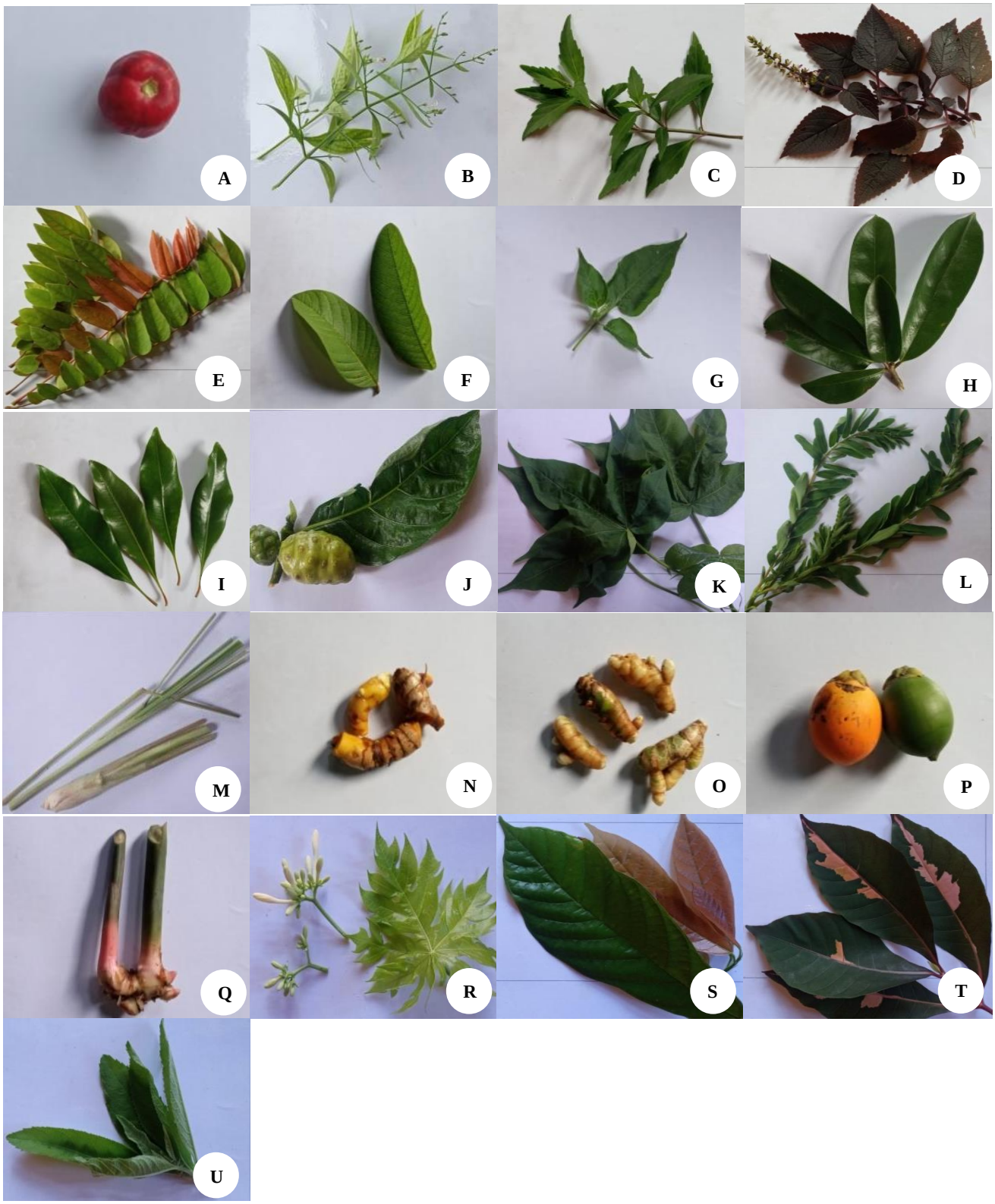

Figure 2. The types of medicinal plants found in the community of Lipulalongo Village, Labobo Sub-district, Banggai Laut District, Central Sulawesi, Indonesia. A. *Phaleria macrocarpa* (Boerl), B. *Andrographis paniculata* Burm.f., C. *Orthosiphon stamineus* Bent., D. *Coleus scutellarioides* (L.) Benth., E. *Averrhoa bilimbi* L., F. *Psidium guajava* L., G. *Capsicum annum* L., H. *Annona squamosa* L., I. *Syzygium aromaticum* (L.) Merr. & L.M.Perry., J. *Morinda citrifolia* L., K. *Gossypium arboreum* L., *Sesbania grandiflora* (L) Pers., M. *Cymbopogon citratus* (DC.) Stapf., N. *Curcuma domestica* Valeton., O. *Curcuma zedoaria* (Christm.) Roscoe., P. *Areca catechu* L., Q. *Alpinia galangal* L., R. *Carica papaya* L., S. *Theobroma cacao* L., T. *Chamaedaphne* sp., U. *Blumea balsamifera* (L.) DC. (Cullen 2006; Steenis et al. 2008; Herbie 2015; Rizal and Sustriana 2019)

Table 1. The types of medicinal plants found in the community of Lipulalongo Village, Labobo Sub-district, Banggai Laut District, Central Sulawesi, Indonesia

Species name	Family	Local name	Part(s) used	Method of use	Treatable disease	Habitat
Phaleria macrocarpa Boerl	Thymelaeceae	Buah mahkota dewa	Fruit	Decoction	Blood pressure disease	Homegarden
Andrographis paniculata Burm.f.	Acanthaceae	Sambiloto	Leaf	Decoction	Back pain, Kidney inflammation	Homegarden
Orthosiphon stamineus Bent	Lamiaceae	Kumis kucing	Leaf	Decoction	Back pain, Kidney stones, Diabetes	Forest
Coleus scutellarioides (L.) Benth.	Lamiaceae	Mayana	Leaf	Decoction	Hemorrhoids, Diabetes	Homegarden
Averrhoa bilimbi L.	Oxilidaceae	Belimbing	Leaf	Decoction	Blood pressure disease	Homegarden
Psidium guajava L.	Myrtaceae	Giawas	Leaf	Decoction	Toothache, Diarrhea medicine	Homegarden
Capsicum annum L.	Solanaceae	Marisa	Leaf	Decoction	Relieve pain	Homegarden
Annona squamosa L.	Annonaceae	Srikaya	Leaf	Decoction	Blood pressure disease, Diabetes	Homegarden
Syzygium aromaticum (L.) Merr. & L.M.Perry.	Myrtaceae	Cingkeh	Leaf, Fruit	Decoction	After giving birth, Asthma	Garden
Morinda citrifolia L.	Rubiaceae	Mangkudu	Fruit	Decoction	High blood pressure, Get rid of bad breath/body	Forets
Gossypium arboreum L.	Malvaceae	Kapas	Leaf	Poultices	Boils, Fractures	Forest
Sesbania grandiflora (L) Pers.	Leguminosae	Turi	Leaf	Decoction	Hot inside, White discharge on the surface of the tongue	Home garden and forest
Cymbopogon citratus (DC.) Stapf.	Poaceae	Mbonout	Leaf	Decoction, poultices	Body warmer	Homegarden
Curcuma domestica Valeton.	Zingiberaceae	Kunyit mosoni	Rhizome	Decoction, poultices	Cure gastric disease	Homegarden
Curcuma zedoaria (Christm.) Roscoe.	Zingiberaceae	Kunyit moute	Rhizome	Decoction, poultices	Typhus	Homegarden
Areca catechu L.	Arecaceae	Posos	Fruit	Decoction, poultices	Vomiting blood	Homegarden
Alpinia galangal L.	Zingiberaceae	Lengkuas	Rhizome	Decoction, poultices	Increase appetite	Homegarden
Carica papaya L.	Cariceae	Tapaya	Leaf	Decoction, poultices	Vaginal discharge	Homegarden
Theobroma cacao L.	Sterculiaceae	Coklat	Leaf	Decoction with *A. bilimbi*, *A. squamosa* leaves	Blood pressure disease, After giving birth	Garden
Chamaedaphne sp.	Ericaceae	Memel	Leaf	Poultices	Fever	Forest
Blumea balsamifera (L.) DC.	Asteraceae	Pakundalang	Leaf	Decoction	Cough, Asthma	Forest

Shahanas et al. (2019) stated that cocoa contains polyphenols consisting of flavonoids and non-flavonoids, which are proven beneficial for health. This is supported by Katz et al. (2011), that found cocoa contains more phenolic antioxidants such as flavonoids, including catechins, epicatechins, and procyanidins than other plant species. In more recent research, Yanez et al. (2021) revealed that cocoa beans contain antioxidant molecules that can inhibit the coronavirus type 2 (SARS-CoV-2), which causes severe acute respiratory syndrome (COVID-19).

Feverish/burning up

The people of Lipulalongo Village use turi leaves (*Sesbania grandiflora* (L) Pers.) to treat feverish/burning up in babies. The *S. grandiflora* is a plant with antioxidant potential because it is rich in vitamin A, vitamin C, thiamine, riboflavin, and nicotinic acid to protect humans from the dangers of oxidation (Ramesh et al. 2015). In addition, this plant has chemical constituents such as arginine, cystine, histidine, isolucine, phenylalanine, tryptophan, valine, threonine, alanine, aspargine, aspartic acid, saponins, oleic acid, galactose, rhamnose, glucuronic acid, flavonoids, and kaempferol (Bhoumik et al. 2016). Flavonoids are chemical compounds that have a very important role in microbial or anti-bacterial inhibitory activity (Padmalochana and Rajan 2014; Arunabha and Satish 2015).

Cough and asthma

The people of Lipulalongo Village use pakundalang/ sembung (*Blumea balsamifera* (L.) DC.) to treat cough and asthma by taking a few leaves, boiling them in the water, and drinking the water 2 times a day with added brown sugar. Our finding is in line with a study by Widhiantara

and Jawi (2021), which found that *B. balsamifera* plants can be used to treat sinusitis, colic pain, coughs, kidney stones, flu, or diuretics. This plant contains several phytochemicals, both volatile (terpenoids, fatty acids, phenols, alcohols, aldehydes, ethers, ketones, pyridines, furans, and alkanes) and non-volatile (flavonoids, flavanones, and chalcones). Compounds widely contained in the leaves of *B. balsamifera* are flavonoid groups including blumeatin, velutin, tamarixetin, dihydroquercetin7,4'-dimethyl ether, ombuine, rhamnetin, luteolin-7-methyl ether, luteolin, quercetin, 5,7,3',5'tetrahydroxyflavanone, and dihydroquercetin-4'methyl ether (Ruhardi and Sahumena 2021). Nursamsu and Firmansyah (2017) stated that people often use the leaves of *B. balsamifera* as a medicine for headaches, colds, pain, fever, diabetes, flatulence, and pain during the menstrual period. The whole plants or crude extracts of the *B. balsamifera* have activities of antitumor, hepatoprotective, superoxide radical scavenger, antioxidant, anti-microbial and anti-inflammatory, anti-plasmodial, anti-tyrosinase, platelet aggregation, increase percutaneous penetration, healing, wound, anti-obesity, and disease-resistant activities (Pang et al. 2014).

Diarrhea

The local community in Lipulalongo Village uses guava (*Psidium guajava* L.) to treat diarrhea. Guava leaves contain essential oils, tannins, flavonoids, phenolic compounds, carotenoids, and vitamin C, which can be used to treat dysentery, gastroenteritis, diabetes mellitus, stomach pain, and wounds (Irshad et al. 2020).

Back pain and kidney inflammation

The people of Lipulalongo Village use all parts of sambiloto (*Andrographis paniculata* Burm.f.) to reduce back pain and kidney inflammation. The mode of application is by drying the roots and stems in the sun, adding 5 leaves, then boiling the three ingredients in 1 cup of water, then waiting until it cools down and drinking it. Other uses are bloating, aches, and pains by boiling the leaves and drinking the boiled water. The *A. paniculata* plant extracts and pure compounds have been reported to have activities of anti-microbial, cytotoxicity, antiprotozoal, anti-inflammatory, antioxidant, immunostimulant, anti-diabetic, anti-infective, anti-angiogenic, hepato-renal protection, sex hormone/sexual function modulation, liver enzyme modulation, insecticidal activity and toxicity (Okhuarobo et al. 2014). In addition, this plant can inhibit viral factors from microbes, acute respiratory infections such as colds and sinusitis, and can also provide immune (Hossain et al. 2021). The results of research by Rahmi et al. (2022) showed that the ethanolic extract (80%) of *A. paniculata* leaves and its main diterpene lactone, andrographolide, may have antihyperuricemic and anti-inflammatory properties and are therefore used to treat gout.

Vaginal discharge

The people of Lipulalongo Village use a mixture of papaya leaves (*Carica papaya* L.) and cingkeh (*S. aromaticum*) to treat vaginal discharge problems in women. In doing so, one young papaya leaf and 5 cloves are dried, washed, sliced , and then boiled with 4 cups of water to make 3 cups and then drink three times a day. Vaginal discharge is caused by *Candida albicans* yeast infection in the vagina. One way of prevention or treatment is by consuming papaya leaf extract. The results of research by Suni et al. (2017) concluded that boiled water of papaya leaves has an inhibitory effect on *C. albicans.* Djunaidi et al. (2015) found that topical administration of concentrated papaya leaf extract 5% during pregnancy in mice increases post-partum vaginal tissue collagen density. Research by Nilofer and Chenthamarai (2021) concluded that *C. papaya* leaf extract contains antifungal compounds that can inhibit *C. albicans*. Papaya has long been used in traditional medicine. Apart from preventing vaginal discharge, the leaf extract treats several infectious diseases such as dengue fever, malaria, and chikungunya (Hariono et al. 2021). In addition to papaya extract, *S. aromaticum* can be used as an antifungal that causes *Candida vaginitis* (Yassin et al. 2020). The main compounds of clove extract are eugenol and -caryophyllene, which are strong anti-bacterial and antifungal agents. In addition, this plant contains essential oils that can inhibit the growth of *C. albicans* (Hiwandika et al. 2021).

In summary, the results of the survey In Lipulalongo Village found several medicinal plants that were found in community yards, and some were also found in gardens and forests. Most types of medicinal plants are deliberately planted for daily use. The researcher's recommendation in this study is to make a book on medicinal plants so that the culture of using medicinal plants is not extinct.

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