BIODIVERSITAS
Volume 24, Number 10, October 2023
Pages: 5359-5367

ISSN: 1412-033X
E-ISSN: 2085-4722
DOI: 10.13057/biodiv/d241018

The diversity, lexicon and cultural practices of family medicinal plants by Tetun Tribe in Malaka, East Nusa Tenggara, Indonesia

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Manuscript received: 19 August 2023. Revision accepted: 16 October 2023.

Abstract. *Hestiyana, Taek MM, Riani, Jahdiah, Yayuk R. 2023. The diversity, lexicon and cultural practices of family medicinal plants by Tetun Tribe in Malaka, East Nusa Tenggara, Indonesia. Biodiversitas 24: 5359-5367.* Medicinal plants are part of traditional culture used by humans to cure illness and improve health. The knowledge, perception and tradition of medicinal plants are unique to certain ethnic groups and therefore imbedded in the local language and passed down for generations. This study aims to describe the diversity and lexicon of family medicinal plants (TOGA) and its cultural practices by Tetun ethnic in Malaka District, East Nusa Tenggara Province, Indonesia. This study used a qualitative descriptive method with an ethnolinguistic approach and combined primary and secondary data. Primary data was collected by documenting a list of lexicons of medicinal plants in TOGA by the Tetun ethnic obtained from traditional healers, old people and community leaders through a series of interviews in the field. Secondary data was obtained from published sources related to this theme of research. The results of the study show that there are 32 lexicons of medicinal plants used by Tetun Tribe. These lexicons can be classified as basic words or monomorphemics (20 plants) and phrases (12 plants). Medicinal plant parts used include roots, rhizomes, tubers, stems, bark, leaves, flowers, fruits and seeds. Methods of preparation of medicinal plants are by boiling, grinding, then rubbing on the affected body part, chewing and brewing with hot water. The Tetun's knowledge of health benefits of medicinal plants is in line with scientific evidences.

Keywords: Lexicon, medicine practices, Tetun ethnic, TOGA

INTRODUCTION

Language is a medium for communication and cultural product of a society (Kemp et al. 2018). In relation to culture, language can be viewed from two perspectives, i.e., language as a subordinate or aspect of culture and language as a coordinate, which views language and culture as two separate systems (Retnowati 2014); Kalle and Sõukand 2021). In a society, language plays an important role in developing knowledge system that shapes the culture of society including the knowledge related to the environment, or often so-called traditional ecological knowledge (TEK). In the context of TEK, language serves as medium to identify and characterize objects in the environment as well as the uses of such objects, for example, plants, which are being used for foods, housing utilities and medicinal purposes. Language is also a medium for explaining the methods and processes of various activities related to the use of certain objects, for example, how one or several plant materials are mixed, processed and served as medicine in the process of curing disease.

One of the traditional elements as part of culture in daily life is using plants as medicinal ingredients. The knowledge of diversity of plant species used as traditional medicines is bound to the perceptions regarding the concepts of illness and health (van't Klooster et al. 2016). Medicinal plants are part of traditional culture used by humans to cure illness and improve health from birth to death (Phumthum et al. 2018). The knowledge and perception on the utilization of medicinal plants have been believed by indigenous societies and therefore passed down for generations) (Rahayu and Mulyati 2006). The knowledge, perception and tradition of medicinal plants are unique to certain ethnic groups and therefore imbedded in the local language (Kujawska et al. 2017); (Maleki and Akhani 2018; Phumthum and Balslev 2019).

Traditional communities use natural materials found around their homes or gardens to fulfill various necessities of life, especially for food and medicine (Caballero-Serrano et al. 2019). In Indonesia, one of the types of knowledge about natural materials around their home is traditional knowledge of medicinal plants developed at family or household level, which is manifested as *Tanaman Obat Keluarga* or TOGA. Medicinal plants under TOGA are usually planted in family gardens with the aims of maintaining health, providing food and creating other sources of income (Ortiz-Sánchez et al. 2015; Darmadi et al. 2023). Furthermore, there is a growing trend for people returning to traditional medicine and utilizing plants, such as jamu, as herbal medicine to treat diseases in this modern era, including COVID-19 (Nurina et al. 2021). *Jamu* is a medicinal herb consisting of medicinal plants that are usually planted in the family garden. Some of the medicinal plants of *jamu* are ginger, turmeric, lemongrass, and curcuma, which contain beneficial bioactivities and

chemical constituents for health (Widyowati and Agil 2018).

Some studies of medicinal plants and their use in many ethnic communities across the world have been carried out, such as the medicinal plants in Purandhar, India) (Bhosle et al. 2009); Wuliang, China (Gao et al. 2019); and Yunnan, China (Li et al. 2020). In Indonesia, similar studies have been carried out in various regions across the country, such as the study on medicinal plants in Tamambaloh Tribe, West Kalimantan (Susanti et al. 2023), Dayak Halong, South Kalimantan (Hestiyana 2021), Papua tribe (Budiarti et al. 2020), and Javanese tribe (Khusna et al. 2023). However, there are limited studies conducted on a lesser-known region, such as in eastern part of Indonesia. Also, previous studies have not touched much on aspects of the medicinal plants in a specific context of situation named with specific language (lexicon). The lexicon reflects and expresses the cultural character, physical environment and social environment in which speakers of a language live and carry out their local wisdom practices. Therefore, differences in research locus can also be a determining factor in differences in results from studies that have similar themes.

The Tetun ethnic in Kobalima Subdistrict, Malaka District, East Nusa Tenggara Province, Indonesia, also plant and use TOGA plants as an alternative to modern medical treatment. The Tetun ethnic is the largest ethnic group in the Malaka District who use the Tetun language to communicate. The Tetun people are spread in almost all subdistricts and villages in Malaka District. They live in the Subdistricts of Kobalima, East Kobalima, West Malaka, Central Malaka, East Malaka, Rinhat, Weliman and Wewiku (Taek et al. 2018).

The Tetun ethnic has long relied on their knowledge of the therapeutic potential of local plants, particularly those belonging to the family of medicinal plants known as TOGA. Therefore, this study aims to identify and describe the diversity and lexicon of medicinal plants in the context of TOGA and the cultural practices of the Tetun ethnic in Malaka District. This research provides an overview of the lexicon diversity of medicinal plants used by the Tetun as traditional medicine. The results of this study can be used as reference material for understanding the lexicon of medicinal plants and provide information to the public regarding the proper use of medicinal plants in the context of TOGA.

MATERIALS AND METHODS

Study area and period

The study was carried out in Kobalima Subdistrict, Malaka District, East Nusa Tenggara Province, in October 2022. Kobalima is located at the border of Indonesia and Democratic Republic of Timor Leste (Figure 1). Kobalima Subdistrict covers an area of 120.95 km^2 with a total population of 17,347 people. The Tetun ethnic group's livelihoods include farming, carpentry, trading and other activities. They reside in the Kobalima district and their native language is Tetun. Based on field observation, the Tetun people cultivate medicinal plants, which are grown around their homes and gardens.

Methods

The Kobalima Subdistrict was chosen as the location for this research because there are still found some traditional healing practices by indigenous people using medicinal plants obtained from the forest or planted in yards and gardens around their houses. The method used in this study is qualitative descriptive method with an ethnolinguistic approach) (Moleong 2018). This study used primary data and secondary data. The primary data was obtained directly from people in the research location in October 2022. The secondary data was gathered from literature reviews on the previous studies related to the topic of this study.

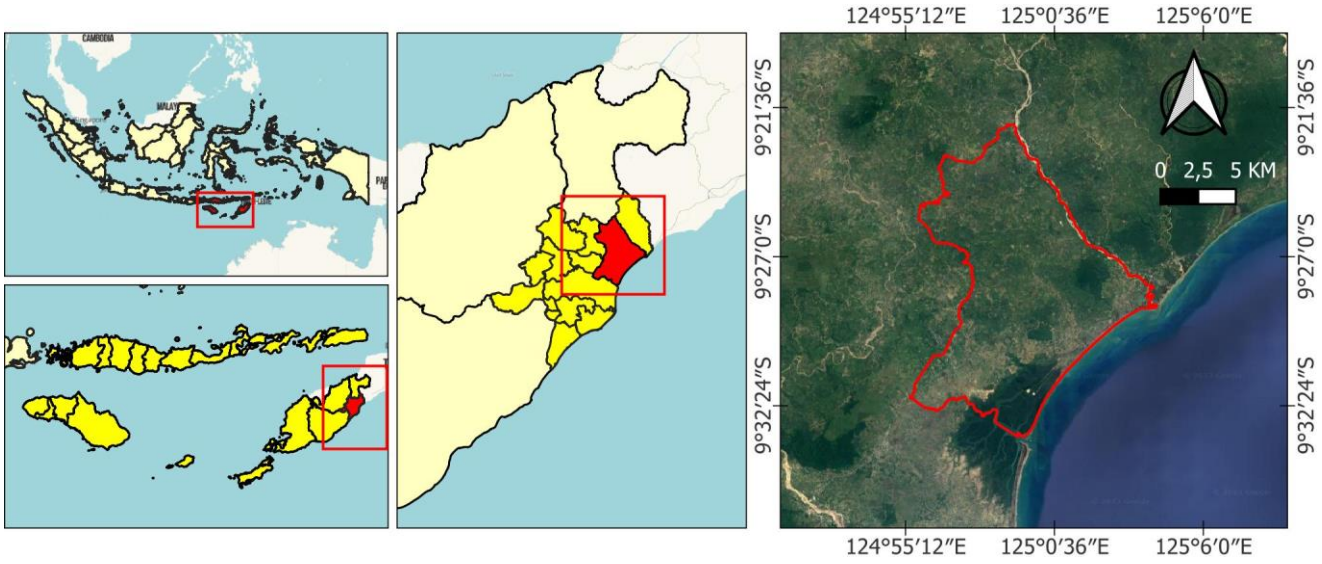

Figure 1. Map of study area in Kobalima Subdistrict, Malaka District, East Nusa Tenggara Province, Indonesia

Collection of primary data in this study used the method of listening, taking notes and interviews with some Tetun community members. Furthermore, deep interviews were conducted to explore data with the traditional healers, old people and community leaders as key informants. There were 30 key informants involved in the interviews, both in one-on-one interviews and group interviews. Interviews with the people in location were conducted informal, freely and, open or non-structured. The researchers only prepared several rather general questions as an opening. Further questions to deepen new information were developed based on the responses or answers given by the informants. The primary data of this study is in the form of a list of lexicons of medicinal plants in TOGA that are used as traditional medicine by the Tetun ethnic people in Kobalima.

Data analysis

Data in the form of interview notes with the common people, traditional healers, elderly people and community leaders were recorded for later analysis. Data analysis was carried out using the equivalent method to find out the overall classification of the lexicon forms of medicinal plants used in traditional medicine of the Tetun ethnic people. The data obtained was then processed by tabulation, and the results are presented in tabular form. The collected data was analyzed based on the form of TOGA lexicon and the cultural practices of medicine by the Tetun people.

The presentation of the results of data analysis uses an informal presentation method. In this study, the results of data analysis on the diversity and lexicon of medicinal plants in TOGA and the medicine cultural practices of the Tetun people are presented in the form of words and sentence descriptions.

RESULTS AND DISCUSSION

Tetun people who live in Kobalima Subdistrict use Tetun as one of the local languages, which is included in the Malayo-Polynesian language's family. In terms of dialect, the Tetun language is divided into Tetun Wekeke (Viqueque), which is used in several places in Timor Leste; Tetun Terik Foho, which is used in the Belu area; Tetun Terik Fehan used in Malaka (Indonesia), and Suai (Republik Demokratik Timor Leste, RDTL); and Tetun Porto which is used as the unifying language in Timor Leste. The Tetun people in the West Timor region (Indonesia) use the Tetun language with a slightly different dialect and vocabulary. The Tetun people in Belu District generally speak Tetun Terik with the Foho dialect (Tetun Terik Foho) and the people of Malaka speak Tetun Terik Fehan.

The diversity of Tetun dialects can cause a shift in the existence of the Tetun language in Malaka District. (Wardhaugh 2006) explains that language shifts and language changes take place continuously over time. This is confirmed by Goddard and Wierzbicka (2014), who explain that changes and shifts in the number of lexicons of a language occur due to additions or subtractions and even omissions.

Diversity and lexicon of medicinal plants used by Tetun Tribe

The Tetun ethnic people use 32 lexicons of plants as traditional medicinal ingredients, as presented in Table 1.

Based on the results, the forms of the medicinal plant lexicon can be described as follows: (i) lexicon in the form of basic words (monomorphemic) and (ii) lexicon in the form of a phrase. There were 32 lexicons of medicinal plants used by Tetun Tribe in Kobalima Subdistrict, including 20 lexicons in the form of basic words or monomorphemic and 12 lexicons in the phrases form.

The lexicon in the form of monomorphemic is a morpheme that can become the basis for morphological processes. This lexicon can be understood as a lexicon composed of one free morpheme. The lexicon in the form of basic words (monomorphemic) are: (i) *advokad*, (ii) *sukaer*, (iii) *blidin*, (iv) *knua*, (v) *kunus/masimanas*, (vi) *koya*, (vii) *tilumaar*, (viii) *ma'ut*, (ix) *silasi*, (x) *kinur*, (xi) *nenuk*, (xii) *asukar* (xiii) *bria*, (xiv) *dila*, (xv) *bua*, (xvi) *hudi*, (xvii) *reo/ende*, (xviii) *tilunasak*, (xix) *mama/fuik*, and (xx) *temulawak*.

Table 1. Lexicon of medicinal plants used by Tetun Tribe in Kobalima Subdistrict, Malaka District, East Nusa Tenggara Indonesia

English name	Local name (Tetun)	Scientific name
Reed	*Hae manlain*	*Imperata cylindrica*
Avocado	*Advokat**	*Persea americana*
Tamarind	*Sukaer*	*Tamarindus indica*
Garlic	*Lisa/liis mutin*	*Allium sativum*
Star fruit	*Blidin*	*Averrhoa carambola*
Red chili	*Kunus/masimanas*	*Capsicum frutescens*
Bitter leaf	*Daun Afrika**	*Vernonia amygdalina*
Genoa	*Knua*	*Acorus calamus*
Ginger	*Masimanas kee*	*Zingiber officinale*
Red ginger	*Masimanas kee mean*	*Zingiber officinale* var. rubrum rhizoma
Guava	*Koya*	*Psidium guajava*
Physic nut	*Badut malakan mutin*	*Jatropha curcas*
Lime	*Derok masin*	*Citrus aurantifolia*
Cumin	*Tilumaar*	*Coleus amboinicus*
Moringa	*Ma'ut*	*Moringa oleifera*
Basil	*Silasi*	*Ocimum basilicum*
Turmeric	*Kinur*	*Curcuma domestica*
White turmeric	*Kinur mutin*	*Curcuma zedoaria*
Noni	*Nenuk*	*Morinda citrifolia*
Devil weed	*Asukar, funan mutin*	*Chromolaena odorata*
Bitter gourd	*Bria*	*Momordica charantia*
Indian tree spurge	*Ai tahan lalek*	*Euphorbia tirucalli*
Papaya	*Dila*	*Carica papaya*
Betel nut	*Bua*	*Areca catechu*
Banana	*Hudi*	*Musa paradisiaca*
Indian ash tree	*Asukar, funan mutin*	*Lannea coromandelica*
Indian redwood	*Tilunasak*	*Caesalpinia sappan*
Lemon grass	*Du'ut morin*	*Cymbopogon citratus*
Betel leaf	*Mama/fuik*	*Piper betle*
Sugar-apples	*Ai atas*	*Annona squamosa*
Elephant foot	*Krau kidan/kbau kbas*	*Elephantopus scaber*
Javanese turmeric	*Temulawak**	*Curcuma xanthorrhiza*

Note: *No local name in Tetun language for the plant

Meanwhile, the lexicon in the phrase form is a combination of two or more words that form a single unit. This phrase does not form a new subject, predicate or meaning. The lexicon of medicinal plants, which belongs to the form of phrases are: (i) *hae manlain,* (ii) *masimas kee,* (iii) *masimas kee mean,* (iv) *daun afrika,* (v) *badut malakan mutin,* (vi) *derok masin,* (vii) *kinur mutin,* (viii) *funan mutin,* (ix) *ai tahan lalek,* (x) *du'ut morin,* (xi) *ai atas,* and (xii) *krau kidan/kbau kbas*. The lexicon of medicinal plants, which is included in the phrase category, has a new word form but does not create a different meaning from the meaning of the previous word.

Two or more basic words that form a lexicon in the form of a phrase generally have a position, as explained below, although there are also many exceptions. Usually, the first word is the general name, which describes the type of medicinal plant. For example: *hae* = grass; *badut* = candlenut; *derok* = orange; *kinur* = turmeric; *du'ut* = lemongrass. The second word is usually an explanatory statement to emphasize the identity of the plant, which distinguishes certain characters, traits or features of the plant that are different from other types in a group of similar plants. This second word can relate to color (for example: *mutin* = white; *mean* = red), aroma (for example: *morin* = fragrant), origin of the plant (for example: *afrika* = Africa; *malaka* = Malaka, Sumatra), how to obtain it (for example: *kee* = by dig), its use (for example: *masin* = used with salt in making chili sauce), similarity in shape to other highly recognizable items (for example: *manlain* = chicken feather).

Meanwhile, the third word is usually a further explanatory statement to further emphasize the difference between the plant and similar plants that have the same name up to the second word. For example: *masimanas kee* and *masimanas kee mean*. The phrase *manimanas kee* refers to the same type of plant, namely ginger, therefore it is necessary to add the explanatory statement *mean* (= red), which refers to the color difference between that type of ginger and common ginger.

The naming of plants in the form of phrases or combinations of words in the Tetun language does not have a specific pattern other than the reason that the second or third word is an explanatory statement used to differentiate plant types, especially plants in a group that has many similarities.

Some medicinal plants have lexicon variations for the same plant referent, such as (i) *lisa/liis mutin,* (ii) *kunus/masimanas,* (iii) *asukar/funan mutin,* (iv) *asukar/funan mutin,* (v) *mama/fuik,* and (vi) *krau kidan/kbau kbas.* Some lexicons have two variations in a form of basic words (monomorphemic) and in a form of a phrase, namely (1) *lisa/liis mutin* and *asukar/funan mutin.* The variation is due to the diverse dialect of Tetun. There are two lexicons originated from the words of Bahasa Indonesia and Javanese. The lexicon originated from Bahasa Indonesia is *daun afrika,* and from Javanese is *temulawak.* The two words exist because the two plants are not native plants of Tetun.

The documentation of 32 lexicons of medicinal plants consisting of lexicons in the category of basic or monomorphemic words and phrases, shows that the Tetun ethnic people have knowledge of the diversity of plants used as traditional medicine as ancestral heritage. These lexicons emerged as a result of the cultural practices of the Tetum that developed amidst the life of their supporting communities.

The lexicon of medicinal plants, as mentioned above, is categorized based on terms or names of plants, and known objects or references. This is influenced by the frequent use of medicinal plants as a traditional medicine by the Tetun people. Therefore, the lexicons attached to the names of medicinal plants need to be preserved. This is necessary so that this traditional knowledge can be learned by future generations. Apart from that, it is also intended that the richness of the lexicon or vocabulary as a marker of the local wisdom of the Tetun ethnic community towards nature and the environment does not disappear from people's memory.

Cultural practices of traditional medicine by Tetun Tribe

Some ethnics have local knowledge of utilizing parts of plants to cure certain diseases (Utaminingrum et al. 2022; Febryano et al. 2023). The Tetun ethnic people, like other tribes, have a unique cultural practice of traditional medicine by utilizing plant diversity as traditional medicinal ingredients. There are many types of plants that are used in traditional medicine. One of them is the use of family medicinal plants (TOGA), which is an important support for family health. The Tetun people believe that the natural environment provides materials for natural treatment, especially through the richness of the plants. In their medical practices, the Tetun people also use traditional medicine for their health, including the use of medicines derived from plants. Even though modern medical treatment is more practical, the Tetun people still use medicinal plants to cure diseases. This is because medicines made from traditional ingredients are cheaper and easy to find. Traditional medicine has become part of the tradition of the Tetun people, especially for communities in rural and suburban areas. Medicinal plants of TOGA have their own functions in traditional medicine used by the Tetun people. Plant species are chosen according to the availability of the plant around the house, yard or garden. For the plant that is not available in the yard, people also ask relatives or neighbors around the house or buy from traditional market.

Plant species and their part(s) used, method of preparation and application in the treatment of illness or complaints and health benefit(s) of the plants of TOGA are shown in Table 2. From the data in Table 2, it can be seen that there are several different plants that can be used to treat the same ailments. For example, *masimanas kee mean* 'red ginger', *ma'ut* 'moringa', *silasi* 'basil', *kinur mutin* 'white turmeric', *bria* 'bitter gourd', *advokat* 'avocado' and *hae manlain* 'reed' are used to treat hypertension and high level of cholesterol. On the other hand, same plant can be used to treat different ailments or diseases. For example, *hudi* 'banana' can be used to treat fever, jaundice and anemia,

and to increase body fitness and improve the digestive system.

Interestingly, the Tetun people believe that wild plants are more efficacious than planted and maintained plants in curing the ailments. However, in this increasingly modern life where many medicinal plants are planted in yards and gardens, especially in the form of aromatic plants, which are also needed as spices, this old opinion is slowly eroding. Many Tetun people now grow several medicinal plants as TOGA for their own family needs for the purpose of preventing and treating diseases or health problems that are considered mild and can be cured without hospital treatment.

Processing or preparation of medicinal plants for medication depends on the plant characteristics and the disease being treated. Medicinal plant can be boiled for drinking, such as *krau kidan/kbau kbas* 'elephant foot'. The leaves of this plant are boiled with boiling water, then cooled, filtered, and then drunk to treat disease. Apart from boiling, there are also other ways of processing plant parts for medication. Several plants are mashed and then placed topically on the affected part of the body. Some are prepared by chewing and then swallowed. In the preparation of medicinal plants for medication, the Tetun people believe that this medicinal ingredient will be more efficacious if prepared traditionally. For example, they assume that medicinal plant materials boiled in a pot made from fired clay will provide stronger properties than if boiled in an aluminum pot.

Table 2. The utilization of medicinal plants by Tetun Tribe in Kobalima Subdistrict, Malaka District, East Nusa Tenggara, Indonesia

Scientific name	Part(s) used	Method of preparation	Method of application	Health benefit(s)
Imperata cylindrica	Roots	Boil	Drink	Cholesterol, hypertension
Persea americana	Fruit, leaves, seeds	Boil	Drink	Oral thrush, bladder stones, facilitate menstruation, headaches, asthma, cholesterol, hypertension
Tamarindus indica	Leaves	Chew, mash	Topical, for massage	Headache, fever
Allium sativum	Tubers	Mash	Topical, for massage	Convulsive
Averrhoa carambola	Leaves, flowers	Boil	Drink	Diabetes, cough
Capsicum frutescens	Fruits	Mash	Topical	Fresh wound
Vernonia amygdalina	Leaves	Mash	Topical, for placed on the wound, for massage	Fresh wounds, coughs, rheumatism, back pain
		Boil	Drink	
Acorus calamus	Rhizome	Chew	Topical, for massage	Flu
Zingiber officinale	Rhizome	Boil	Drink	Fever, cough
Zingiber officinale var. rubrum rhizoma	Rhizome	Boil	Drink	Cholesterol, menstrual pain, nausea, joint pain, boost immunity
Psidium guajava	Leaves	Chew	Chew and swallow	Stomach ache, cough
Jatropha curcas	Leaves, stem bark juice	Mash, tap the juice	Topical, for massage Drop in tooth cavity	Cough, toothache
Citrus aurantifolia	Fruits	Squeeze	Drink	Cough, boosts immunity, improves digestion
Coleus amboinicus	Leaves	Squeeze	Drink	Coughs and colds
Moringa oleifera	Leaves	Boil	Drink	Uric acid, relieves aches and pain
Ocimum basilicum	Leaves	Boil	Drink	Hypertension
Curcuma domestica	Rhizome	Boil	Drink	Sprains, coughs, vaginal discharge, menstrual disorders
Curcuma zedoaria	Rhizome	Boil	Drink	Cysts, internal diseases
Morinda citrifolia	Leaves	Boil	Drink	Back pain
Chromolaena odorata	Leaves	Mash	Topical, for place on the wound, for massage	Fresh wound, headache
Momordica charantia	Leaves, fruits	Boil	Drink	Diabetes
Euphorbia tirucalli	Stem	Tap the latex from stem	Drop into wound	Wounds
Carica papaya	Leaves	Boil	Drin	Fever, malaria
Areca catechu	Leaves	Mash	Topical, for massage	Back pain
Musa paradisiaca	Leaves, fruits, stem	Boil	Drink	Fever, increasing endurance, anemia, improving the digestive tract, jaundice
Lannea coromandelica	Leaves	Boil	Drink	Cough, fever
Caesalpinia sappan	Wood	Boil	Drink	Thyroid, blood booster
Cymbopogon citratus	Stem	Boil	Drink	Rheumatism
Piper betle	Leaves	Boil	Drink	Vaginal discharge
Annona squamosa	Leaves	Boil	Drink	Laxative intestinal worms, boils
Elephantopus scaber	Roots, leaves	Boil	Drink	Prevent vomiting, fever, boils
Curcuma xanthorrhiza	Rhizome	Boil	Drink	Cough, increase appetite

Many of the medicinal plants used by the Tetun people have scientific evidence regarding their medicinal properties. In fact, local knowledge of the Tetun people on the health benefits of medicinal plants is in line with the findings of some previous research on those medicinal plants. The health benefits of the plants based on the previous research are described as follows.

The roots of *hae manlain* 'reeds' (*Imperata cylindrica*) are known to contain various forms of important active substances. Several important compounds in *I. cylindrica* are mannitol, glucose, citric acid, malic acid, saccharose, cylindrin, fernenol, coixol, arundoin, anemonin, simiarenol, resin, alkali metals, and grit acid. Based on its content, the health benefits of *I. cylindrica* are for nosebleeds, cholesterol, hypertension immunomodulatory, antibacterial, antitumor, anti-inflammatory, and liver protection activities both in vivo and in vitro (Jung and Shin 2021).

Lisa/liis mutin 'garlic' (*Allium sativum)* is used by the Tetun people to treat convulsive. Numerous studies have linked garlic's biological activities, including its antimicrobial, antioxidant, anti-aging, anti-inflammatory, anti-cancer, and anti-acne properties. Garlic is medical diet therapy that has been utilized to treat coronary and cardiovascular diseases, particularly in geriatrics and the elderly population. In addition, garlic also contains high antioxidant that is useful to prevent various exposures to free radicals that can trigger health problems. The various benefits of garlic are to overcome flu, to control cholesterol, to boost immune system, to prevent cancer, and to lower blood pressure (Ezeorba et al. 2022).

Bria 'bitter gourd' (*Momordica charantia)* is a nutrient-rich plant containing bioactive substances, such as alkaloids, polypeptides, vitamins, and minerals. Due to the presence of bioactive substances, it has the power to combat a number of lifestyle-related diseases, such as scabies, fever, and kidney stone, as well as cancer resurgence and diabetes mellitus. Its bioactive molecule, *p*-insulin, is comparable to insulin, whose subcutaneous injection significantly reduced blood glucose levels. It has some alkaloids, similar-acting peptides, and steroidal saponins known as charantin that are efficient for regulating blood sugar levels. It aids in controlling blood cholesterol levels, so defending the body against cardiovascular diseases like atherosclerosis (Saeed et al. 2018).

Mama/fuik 'betel leaf' (*Piper betle)* contains antibacterial, antioxidant, scavenging, estragole, anethole, iso-eugenol, and terphenyl acetate capacities. Due to the presence of antioxidant chemicals such as phenolics, alkaloids, and flavonoids, the bioactive components of betel leaf have shown the potential to combat cancer (Gupta et al. 2022).

Ai atas 'sugar-apples' (*Annona squamosa*) contains various vitamins and minerals which are good for health. It has Vitamin C and B6, calcium, potassium, magnesium, iron, water, fat, fiber and protein. The leaves of *A. squamosa* have antibacterial and wound-healing substances. The decoction of *A. squamosa* leaves or its combination with other plants can be absorbed by the body well as a febrifuge, cold cure, and used in the bath as an alternative to treat rheumatic pain (Safira et al. 2022).

Daun afrika 'bitter leaf' *(Vernonia amygdalina*) has numerous benefits for combating human diseases. *Vernonia amygdalina* has been utilized extensively for helping women become fertile and its leaves are good against fevers. It is frequently used to treat a variety of parasitic conditions, including schistosomiasis and amoebic dysentery, as well as inflammatory diseases, bacterial infections, burns, diabetes, gastrointestinal disorders, liver diseases, kidney problems, nausea, hepatitis, hypertension, cough, menstrual pain, convulsions, and burns. Hepatitis, venereal illnesses, and cuts can all be treated using the plant's leaves, root, and twig (Oyeyemi et al. 2018).

The leaves of *asukar, funan mutin* 'devil weed' (*Chromolaena odorata*) are used to make an aqueous extract and decoction that is frequently used to treat burns, wounds, and illnesses like diabetes, high cholesterol, dyspepsia, hypertension, vertigo, and diet-related illnesses. The pharmacological effectiveness of *C. odorata* has been supported by a large body of scientific research. *Chromolaena Odorata* has characteristics that are anti-inflammatory, anti-malarial, anti-cancer, anti-diabetic, antifungal, anti-hepatotoxic, antimicrobial, and antioxidant (Mugwedi 2020).

Kunus/masimas 'red chili' (*Capsicum frutescens*) is a source of vitamin A, vitamin B, vitamin C and vitamin E. It has other minerals such as magnesium, copper, molybdenum, potassium, folate, manganese and thiamin. Chili also contains compounds such as alkaloids and capsaicin that makes chili hot. Capsaicin is an antibacterial, anti-carcinogenic, anti-diabetic and has analgesic properties. Capsaicin substances can reduce cholesterol levels in the blood. Capsaicin is utilized as an alternative medicine remedy in the treatment of uremic pruritus in people with chronic kidney disease. Capsaicin's local infiltration and results demonstrated that it offers a potentially effective medicinal remedy for knee osteoarthritis pain. Capsaicin cream is good for women who experience post-mastectomy pain syndrome (Catalfamo et al. 2022).

Sukaer (*Tamarindus indica*) also referred to as tamarind, is a member of the Fabaceae family and is frequently utilized in Ayurvedic herbal medicines as well as traditional cuisine. Numerous studies have shown that every part of *T. indica* has medicinal value. Proanthocyanidins in *T. indica*, an oligomeric type of flavonoids also known as condensed tannins, are employed as powerful antioxidants and are commonly present in the skins of fruits and vegetables. The tamarind pericarp includes these phenolic antioxidants is a source of antioxidants because it is rich in phytonutrients. It can increase the body's ability to keep the immune system primed. Antioxidants are also needed to reduce the impact of inflammation caused by oxidative stress (Akter et al. 2022).

The vesicant and rubefacient latex of *ait ahan lalek* 'indian tree spurge' (*Euphorbia tirucalli)* is used to treat rheumatism, warts, cough, asthma, earaches, toothaches,

and neuralgia. It helps prevent leprosy and postpartum foot paralysis. *Euphorbia tirucalli* exhibits human lymphocyte activity, as well as analgesic, anthelmintic, anti-arthritic, antibacterial/antifungal/antimicrobial, and anti-HIV properties (Mali and Panchal 2017).

Koya 'guava' (*Psidium guajava)* is used to cure diarrhea, dysentery, gastroenteritis, hypertension, and diabetes. The leaf extract is used as medicine for mouth ulcers, cough, diarrhea, and some wounds with swollen gums. Its fruit is abundant in minerals, as well as vitamins A, C, iron, phosphorus, and calcium. It has a significant amount of organic and inorganic substances such as secondary metabolites, such as polyphenols, antioxidants, antiviral substances, and anti-inflammatory substances compounds. *Psidium guajava* leaf contains quercetin as the most potent antioxidant. Both the thymus synthesis and the germ infection can be stopped by its ethyl acetate extract (Naseer et al. 2018).

Badut malakan mutin 'physic nut' (*Jatropha curcas*) contains α-amirin, campesterol, stigmasterol, β-sitosterol, 7-keto-sitosterol, and HCN. Meanwhile, the pharmacological effects possessed by *J. curcas* include stagnant blood dispelling, eliminating swelling, stopping bleeding, and relieving itching (anti-pruritic). The leaf, stem sap, or dried powdered plant jatropha is applied to flesh wounds as a hemostat. Roasted leaves are ground with saliva and used as a paste to treat wounds and abscesses. For newborns with tetanus, a few drops of a diluted water solution made from twig sap are administered orally. The seeds have also been employed as a purgative, anthelminthic, and abortifacient in the treatment of ascites, gout, paralysis, skin disorders, and paralysis. The chemical in the seed oil has been used to treat rheumatism (Abdelgadir and Van Staden 2013).

Tilumaar 'cumin' (*Coleus amboinicus)* is a group of phytogenic immunostimulants. It has a variety of macro and micronutrients, including ascorbic acid, eicosanoids, oleic acids, flavonoids, phenols, zinc, and calcium. Due to its high nutritional content and phytochemical potential, it contains bioactive qualities such as anticlotting, analgesic, antibacterial, antifungal, antianxiety, antineoplastic, anti-urolithiactic, anti-inflammatory, anti-diabetic, antibiofilm effectiveness, and antimicrobial. It also promotes wound healing, relieves chest congestion, treat burns, whooping cough, sinusitis, asthma, rheumatoid arthritis, and myoclonic jerks, while preserving skin health (Satheesh et al. 2022).

Derok masin 'lime' (*Citrus aurantifolia*) has a variety of phytochemical substances, including alkaloids, flavonoids, steroids, and triterpenoids as well as saponins, tannins, and phenolics, which are all beneficial to human health. *Citrus aurantifolia* can increase immunity, improve digestion, overcome respiratory tract disorders, reduce the risk of cancer, lose weight, prevent diabetes, and maintain healthy skin. *Citrus aurantifolia* peel is also used for hand sanitizers, gel products, mosquito repellents, and nanoparticles made of chitosan) (Ramadaini et al. 2020)

Advokat 'avocado' (*Persea americana*) fruit contains potassium that is useful for helping control blood pressure and preventing high blood pressure, oral thrush, bladder stones, facilitate menstruation, headaches, asthma, cholesterol, and hypertension. Potassium is also very good to help regulate heart rate to stay normal. *Persea americana* seeds contain a variety of bioactive substances, including phenolic compounds, triterpenoids, fatty acids, amines, acetogenins, procyanidins, and weak acids. These substances have potential uses as antioxidants, antimicrobials, insecticides, hypocholesterolemic, anti-diabetic, for treating hypertension, lipid substitutes, and bases for soap (Soledad et al. 2021).

Ma'ut 'moringa' (*Moringa oleifera*) leaves are very rich in vitamins (e.g., vitamin B1, vitamin A, vitamin B3, vitamin C, vitamin B6, vitamin B2, and folate) and minerals (e.g., magnesium, iron, calcium, phosphorus and zinc). Moringa can treat malnutrition because it contains a wide range of vital phytochemicals in its leaves, pods, and seeds. *M. oleifera* is frequently referred to as a panacea because it may treat more than 300 ailments. It can cure both type 1 and type 2 diabetes effectively (Gopalakrishnan et al. 2016).

Kinur 'turmeric' (*Curcuma domestica*) contains protein, folate, potassium, calcium, and a variety of vitamins needed by the body. Its benefits range from overcoming digestive problems to preventing eye degeneration. Meanwhile, *kinur mutin* 'white turmeric' (*C. zedoaria*) contains curcumin and terpenoids in the plant. Both of these substances act as antioxidants, anti-cancer, anti-inflammatory, and antipain (Munekata et al. 2021).

Masimas kee 'ginger' (*Zingiber officinale*) is a member of the Zingiberaceae. It contains good nutrition, such as fiber, protein, calories, and various types of vitamins. Its benefits range from relieving menstrual pain, improving brain function, to alleviating arthritis symptoms. *Masimanas kee mean* 'red ginger' (*Z. officinale* var. rubrum rhizoma) contains essential oils and quite a variety of bioactive compounds, such as shogaols, paradols and gingerols. These compounds are quite active as anti-inflammatory, anti-cancer, and antifungal (Anh et al. 2020)

Dila 'papaya' (*Carica papaya*) is rich in nutrition containing calories, carbohydrates, protein, fat, fiber, antioxidants, vitamin A, vitamin B1, vitamin B2, vitamin B3, vitamin B5, vitamin B6, folic acid, vitamin C, vitamin E and vitamin K. *Carica papaya* is beneficial for digestion, improving the immune system, nourishing heart, skin, and hair, and healing wounds (Ugbogu et al. 2023).

*Silas*i 'basil' (*Ocimum basilicum*) contains a number of minerals, namely manganese, potassium, copper and magnesium. Basil helps control heart rate and blood pressure and the antioxidant enzyme, superoxide dismutase (Brandão et al. 2022; Do Nascimento et al. 2020).

Nenuk 'noni' (*Morinda citrifolia*) is a well-known medicinal plants and alternative of traditional medicine to cure illness and maintain health. It is useful for treating various diseases, from headaches, flu, to diabetes. It contains substances that are anti-inflammatory and antibacterial) (Abou Assi et al. 2017).

Du'ut morin 'lemongrass' (*Cymbopogon citratus*) stalks can be used as a urine laxative, sweat laxative, phlegm or cough medicine, mouthwash, body warmer, digestive disorders, stomach aches, colds, antifever, vomiting

prevention, and others. It has also essential oil (Mendes Hacke et al. 2020). The plant is also a potential medicine for combating influenza and coronaviruses) (Wani et al. 2021).

Tilunasak 'indian redwood' (*Caesalpinia sappan*) wood contains many active compounds, namely brazilin, alkaloids, flavonoids, saponins, tannins, phenyl, propane, terpenoids, gallic acid, phellandrene, ocimene, and resin. Meanwhile, the leaves contain essential oil of not less than 0.20% which has a pleasant aroma and is colorless. Benefits of its wood include treating cancer and tumors, increasing immunity, treating gout, lowering blood sugar levels, and antibacterial. Anti-inflammatory maintains liver health and inhibits herpes (Hwang and Shim 2018).

The root of the *krau kidan/kbau kbas* 'elephant foot' (*Elephantopus scaber)* is used to prevent nausea and vomiting. In medical practice, the roots are boiled and the water is drunk in the morning and evening. Its leaves contain flavonoids, alkaloids, terpenoids, and saponins. This combination of substances is considered to have a number of benefits, including anti-cancer, antioxidant, anti-inflammatory, and antiviral properties (Kharat and Mendhulkar 2016; Silalahi 2021).

From the presentation about the pharmacological properties of various medicinal plants used by the Tetun community in Kobalima Subdistrict, Malaka District, it can be seen that the local wisdom of the community in terms of using these plants as traditional medicine has apparently received scientific justification from the results of various previous scientific research.

The Tetun people still adhere to the traditions and medical knowledge passed down from their ancestors from generation to generation. This can be seen from the large variety of lexicons of medicinal plants and the various components in traditional medicine. The utilization of traditional medicine by Tetun ethnic people is an expression of their local wisdom and understanding of cultural resources, particularly the treasury or vocabulary of Tetun language regarding medicinal plants.

In conclusion, many Tetun people in Kobalima, Malaka District still use plants as medicine to prevent and treat disease. Apart from plants obtained in the wild, many people have planted their own medicinal plants for their own family needs under TOGA. There are 32 plants documented for medicinal uses by the community. Based on linguistic analysis, the lexicon of these 32 plants consists of 20 of basic words, and 12 of phrases. In the cultural practice of the Tetun traditional medicine, various medicinal plants are used in simple method of preparation and application. The 32 lexicons are preserved and used by Tetun to have a healthy life in their community. Various scientific researches have justified scientifically the utilization of these plants. Thus, it can be recommended to the people to preserve and use these plants as alternative to modern medicines because of their efficacy to treat some illness, diseases and health problems. For further studies, it is necessary to investigate how local community knowledge about the lexicon of medicinal plants and traditional healing practices is spread among the younger generation. It is important to design programs as early as possible that help preserve local knowledge and wisdom about traditional medicine, for example through providing supplementary material in lessons in primary and secondary schools.

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