

# Lexicon of Traditional Antimalarial Medicinal Plants in the Tetun Community in Belu and Malaka Regency

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**Abstract.** This study aims to describe the lexicons of medicinal plants for Malaria treatment in the Tetun community. The research method is descriptive qualitative with an ethnolinguistic approach. The data were obtained from interviews with informants using the snowball technique. The data were the lexicons which are interpreted based on the cultural understanding of the Tetun community. The results show that there are 97 lexicons consisting of 50 words, and 47 phrases. Parts of plants include leaf, root, stem, seed, tuber, rhizome, bark, fruit, clove, and all parts of the plant. The modes of administration are decoction, boiling, paste, and paste with coconut oil. The modes of preparation are drinking, massaging, bathing, massage, inhalation, and cataplasm. Other Malaria-related lexicons are *luli* or *hale'u* (prohibitions and taboos), *hemu aitahan* (herbal medicine), and *makdok* (traditional healer). Knowledge of the lexicon of medicinal plants is local knowledge and wisdom of the Tetun community that needs to be preserved.

**Keywords:** Lexicon, Medicinal plants, Malaria, Ethnolinguistics

## 1 Introduction

The existence of medicinal plants has long been recognized and used in traditional medicine to cure various diseases [2]. Several studies on herbal medicine have been carried out in various countries in the world, for example in the Gollobordo region, located in Eastern Albania and the border of the Republic of Macedonia [3], in Gongcheng in northeastern Guangxi, southern China [4], in Brazil [5]. From these studies, it is known that traditional medicinal plants are unique in each region because they are influenced by geographical and socio-cultural factors of the local community. In addition, the continuity of knowledge of traditional plant-based medicine is gradually declining due to the lack of regeneration of knowledge transmission [4].

However, traditional medicinal plants have become a trend again during the COVID-19 pandemic as an alternative to increase immunity, such as tea [6] and jamu (herbal medicine) [7]. Herbal medicine (jamu) as a traditional medicine has been known for hundreds of years [8]. The existence of herbal medicine in the past can be seen in the ancient manuscript of Serat Prombon Jampi Jawi I [9]. The efficacy of herbal medicine as a medicinal plant has also been widely

studied, for example as a natural antibiotic drug [10]. In addition to jamu (herbal medicine), medicinal plants in other areas of Indonesia are diverse and unique and have been widely studied, including medicinal plants in South Sulawesi [11], Kalimantan [12], and Papua [13].

Whereas, medicinal plants in the border areas of Indonesia and Timor Leste, especially Belu and Malaka Regency, are also commonly found, especially for the treatment of malaria [1]. Malaria in the border area of Indonesia and Timor Leste is one of the most dangerous disease outbreaks [14]. Malaria is a disease that has existed since ancient times [15]. Efforts to treat malaria with medicinal plants have long been known in various regions as seen in studies [16], [17], and [18]. Malaria has also been known to the Tetun community in Belu and Malacca districts for a long time. This is based on the historical records of the Dutch Missionaries that in the 1800s many people had suffered from malaria. The Tetun tribe used traditional medicines to treat various diseases. The shaman or called *makdok* or *doc* plays a role in treating the sick by using the knowledge he has acquired from generation to generation. Both shamans and self-medicating often take advantage of the medicinal properties of medicinal plants. By looking at the history of the existence of malaria, the Tetun people have always had the concept of malaria and methods to use medicinal plants to cure malaria [19].

Medical plant to treat Malaria in the border areas of Indonesia and Timor Leste, especially Belu and Malaka Regency, had also been investigated by Taek [20]. The study is field research and uses an ethnomedicine and anthropological approach. Although the object of the study is the same, namely medicinal plants for malaria in Belu and Malaka Regency, this study is different from the previous study because this study is based on an ethnolinguistic approach to the analysis of the lexicon of medicinal plants. Therefore, this study also aims to complement the wealth of previous studies.

Ethnolinguistics is from the word *ethnos* which means ethnicity and *linguistics* which means the study of language. Thus, ethnolinguistics is defined as the science of language and relating to the culture of an ethnic group or society in the world [21]. The object of the study is the linguistic dimension (lexicons, phrases, clauses, discourses, other lingual units) in social and cultural dimensions (such as ritual ceremonies, cultural events, folklore, and others) to promote and maintain cultural medical practices and structures of social community [21]. The method departs from linguistic facts toward cultural phenomena [22]. The word *lexicon* is from Ancient Greek, namely *lexicon* which means 'word', 'speech', or 'way of speech'. The lexicon is defined as a collection of vocabularies of a language used by a particular individual or society or in a particular field [23]. Studies of the lexicon of medicinal plants in Indonesia using an ethnolinguistic approach have been widely carried out in the areas of Sambas Regency, West Kalimantan [24], Lodoyong Village in Semarang [25], South Kalimantan, the Dayak tribe [26], and the Tatamba kampong and tatuha kampong communities in Subdistrict Karang Intan [27]. These studies show that there are various lexicons of medicinal plants that are unique to each region. Likewise, there is a lexicon that refers to the procedure for using it with its function which reflects the culture of the local community.

In contrast to previous studies, this study uses an ethnolinguistic approach with the object of the medical plant lexicon for treating Malaria in Belu and Malacca regencies. The purpose of this study is to describe the lexicon of medical plants for treating Malaria in the Tetun community. These objectives are translated into problem formulations: (1) What are the forms of the lexicon of medicinal plants for malaria treatment; (2) what are the medicinal plant lexicons which are included in the category of the parts of the plant used for treatment, mode of administration, and

mode of preparation; (3) what are the lexicons related to the prevention, symptoms, and traditional treatment practices of malaria.

## **2 Method**

This study used a qualitative descriptive method with two steps, namely data collection and data reduction, display, and analysis.

### **a. Data collection**

In collecting data, there are two ways, namely the collection of written data and oral data. The written data were obtained from the literature study that had been carried out by Taek [1]. The data in this study were the lexicon of medical plants for malaria treatment, methods of prevention, and traditional treatment of malaria. Oral data were obtained from observations in the field. In collecting data in the field, two techniques were used, namely observation techniques and interview techniques. Observation is a data collection technique that has specific characteristics when compared to other techniques [28]. Observations were made by observing directly the use of the lexicon of medicinal plants for Malaria treatment in the Tetun community, Belu and Malacca regions. Semi-open interviews were conducted with informants to dig deeper into the lexicon of medical plants for malaria treatment. Data were collected by listening and noting the use of the medical plant lexicon for Malaria treatment.

### **b. Data reduction, display, and analysis**

The data were reduced by removing irrelevant data so that it could list the lexicon of medical plants for malaria treatment. The data were then presented descriptively by using words, tables, or charts. The data were then analyzed by classifying the medicinal plant lexicon, the part of the plant, the mode of administration, and the mode of preparation. Furthermore, the meanings of the lexicons related to the prevention, symptoms, and rituals of the treatment of malaria were also explained.

## **3 Findings and Discussion**

In this section, the findings of medicinal plants for malaria treatment are presented in the Tetun community, Belu, and Malaka region. The lexicon consists of 97 lexemes. The findings are then classified based on the form of language, the part of the plant used for treatment, the mode of administration, and the mode of preparation. The meaning of the lexicons of prevention, symptoms, and rituals of the treatment of malaria are also discussed.

### **3.1 The Form of Medical Plant Lexicon**

Based on data analysis, there are 97 lexemes of medicinal plants for malaria in the form of nouns consisting of words and phrases. Here are some lexemes in the form of words and phrases.

**Table 1**  
**The Form of Medical Plant Lexicons**

The Lexicon in Form of Word		The Lexicon in Form of Phrase	
abano	knuan	ai dois metan	kbau kbas, krau kidan
aruda	kolokoan	ai fetu	klatur dian
asulerok	koya	ai lakar	koke lotu
babotore	krui	ai leu lahat	kroti metan
bakumoru	kulu	ai malae	kroti mutin
bakuro	lakaur	ai moe lalek	kunus aleten
baulenuk	lenok	ai tahan tolu	lalitin fetu
beko	lorowen	ai tatasik	lalitin mane
besak	mahoni	ai siba	liman tohar
bubur	mamumus	ai sisi	lisa mean
dila	manliras	ata bot	lisa mutin
dilabutak, dilafatuk	masimanas	ata lotu	masimanas kee
fafok	kunus	ata malae	masin borat
feu	ma'ut	badut malaka mean	meda lasan
fuik	mukrin	badut malaka mutin	moat tiris
fuka	nenuk	badut mi	riman isin
hali	renes	blidin lotu	sakiki mean
kabasa	salur	blidin wai	silasi mean
kabidawa	samer	bria fuik	silasi mutin
kafiru	sukabi	derok masin	tau tiu ten
karlulu	sukaer	frasuk ten	tubi tahak
katimun	taburut	hae manlain	uas laomea
kinur	tateka	kabas fuan mean	
klan	taun	kaboen fuik	
knabu	kaut	kala mean	

From the data, there are 50 medicinal plant lexemes in the form of words. Meanwhile, there are 47 plant lexemes in the form of phrases. The data then analyzed the categorization of parts of a medical plant for malaria treatment, the part of the plant used for treatment, the mode of administration, and the mode of preparation.

### **3.2 Part of The Plant, Mode of Administration, and Mode of Preparation**

Parts of the plant used for making Malaria drugs are called *simplicia*. The parts of the plant are 1) bark (cortex), 2) wood (lignum), 3) leaves (folium), 4) flowers (flos), 5) roots (radix), 6) tubers (bulbus), 7) Rhizome (rhizome), 8) Fruit (fructus), 9) Fruit leaf (pericarpium), and 10) Seed (cemen) [29]. The Tetun people categorize malaria treatment plants based on parts of the plant used to treat malaria, including leaf, root, stem, seed, tuber, rhizome, bark, fruit, cloves, and all parts of the plant.

Some medicinal plants are taken for their leaf to treat malaria, such as *ai dois methane*, *ai dois methane*, *ai malae*, *bakuro*, *beko*, *dila*, *fuik*, *kabasa*, *kabidawa*, *kaut*, *koya*, etc. Some medicinal plants are taken for their bark to treat malaria, such as *abano*, *ai fetu besak*, *badut malaka mutin*, *badut malaka mean*, *fafok*, *feu*, *kafiru*, *katimun*, *kroti mutin*, *mukrin*, and *salur*. Some medicinal

plants are taken for their root to treat malaria, such as *hae manlain*, *kabas fuan mean*, *koke lotu*, *kolokoan*, *lenok*, *lorowen*, and *ma'ut*. Three medicinal plants are taken as whole plants to treat malaria, such as *babotore*, *karlulu*, and *renes*. Some plants can be used not only in one part, but with other plant parts, such as *nenuk*, *ai lakar*, and *kroti methane*. Some are taken for their fruit, namely *masimanas* and *kunus*. Some medicinal plants are taken for their rhizomes, such as *kinur*, *knuan*, and *masimas kee*. There is also only the stem taken, for example, *klatun dian*.

The mode of administration is categorized into several types including decoction, paste, boil, boil, and paste in coconut oil. The decoction plant lexicons are *ai lakar*, *ai sisi*, *abano*, *babotore*, *badut malaka mean*, *badut malaka mutin*, *dila*, and *fafok*. The pasted plant lexicons include *asulerok*, *badut mi*, *klan*, and *lakaur*. The pasting process is mostly done by the Tetun people. The boiled plant lexicons are *kulu*, *tateka*, *tubi tahak*, and *koya*. The pasted in coconut oil plant lexicon include *lisa mean*, *lisa mutin*, and *sila mutin*. There is also a plant that does not need to be processed, namely mahogany seed.

The mode of preparation is categorized into several types, including oral, massage, bath, inhalation, and cataplasm. The plant lexicon that is used orally, such as *abano*, *ai lakar*, *bakumuro*, *besak*, and *kinur*. The plant lexicons used by massage are *kaut*, *knuan*, *lisa mean*, and *lisa mutin*. The plant lexicons used by bathing are *sila mean*, *sukabi*, *sukaer*, and *taun*. Plant lexicons used by cataplasm are *baulenuk*, *dila*, *fuik*, and *liman tohar*. Plant lexicons used by inhalation are *ai lakar*, *ata bot*, and *ata malae*. Plant lexicons used by cataplasm are *baulenuk*, *ma'ut*, and *mamumus*. Cataplasm refers to a heated and medicated moist mass that is applied to the skin to treat an inflamed or painful area of the body. Based on the data, most of the malaria medicinal plants are used by massage, namely 51 types of plants. Some plants are used in more than one preparation, for example, *badut malaka mutin*. This plant is used by decocting and then drinking it. The plant can be used by pasting it and then using it as a massage oil.

The findings are in line with the finding by Budiarti et al. [18] because most of the parts of plants used in Papua and Belu and Malaka regency are leaves that have a bitter taste. The use of the leaf as malaria medicine in Papua is due to its abundance, for example, papaya leaf. Similar to medical plant conditions in Papua, plants used as Malaria medical plants in Belu and Malaka regency are plants that are available in abundance so they are easy to obtain.

The Tetun people have known the lexicon of malaria treatment plants including plant parts, mode of administration, and mode of preparation. This knowledge is acquired by the Tetun people from generation to generation. This medicinal plant is an integral part of the Malaria treatment ritual which is explained in the following section.

### **3.3 Lexicon of Malaria Prevention and Treatment**

In addition to the medicinal plant lexicon for Malaria treatment, there are several lexicons related to Malaria prevention and traditional treatment using the medical plant lexicon. The Malaria prevention lexicons are *luli* or *hale'u*, *suas uma*, *tua moruk*, *son loro*, and *son udan*.

The Tetun people believe that Malaria can be prevented by adhering to the rules of *luli* or *hale'u* (abstinence or avoidance), drinking bitter herbs, and eating bitter foods. The lexicon *luli* or *hale'u* means behaviors or actions that should not be done. They must avoid certain situations or conditions that can cause the body to be susceptible to malaria. Some of these behaviors are eating sweet foods or drinks, getting hot in the hot sun (*son loro*), soaking in cold water for too

long, getting rained on (*son udan*), and being too tired to work (*kole*) or doing activities. Another way of prevention can be by burning scented plants, such as cendana wood, onion peel, lime leaves, chicken feathers, and cow horns. This method is called *suas uma* or house fumigation.

To prevent Malaria, the Tetun people recommend eating and drinking bitter taste. Some recommended plant lexicons to be eaten because of their bitter taste are decoction of *dila* leaves (papaya), leaf shoots and bark of *samer* (mindy), leaf shoots and bark skin of *kroti mutin*, bark skin of *kroti metan*, and *bakumoru* wood. The habit of eating and drinking bitter has been accustomed since childhood to prevent malaria, especially papaya leaf and bitter melon leaf.

Another cause of malaria is fatigue (*kole*) due to work or activities. To restore stamina so that they are not easily infected with Malaria, the Tetun people recommend drinking bitter drinks, namely *tua moruk*, the traditional drink. *Tua moruk* is a bitter-tasting drink made from soaking the skin of several types of snakewood plants. This drink is considered an antidote to sweet food or drinks as the cause of Malaria.

The lexicons related to Malaria symptoms and its treatment are *isin manas*, *kiki*, *sa'u* or *hakoruk*, *haris*, *taka kok*, *tapel*, *hemu aitahan* or *hemu kwa*, *horut*, *makdok*, *hakbut*, *kaban*, *kasu*, *hakasuk*, and *hakaluk*.

The word *isin manas* means the increased body temperature and *kiki* means a shivering body which indicates that someone is starting infected by Malaria. Malaria patients are treated by lowering their body temperature through external treatment. The external medical lexicons are *sa'u* or *hakoruk* (massaging), *haris* (bathing), and *taka kok* (sticking medicinal herbs to the waist above a swollen spleen, usually using a *tapel*). *Sa'u* or *hakoruk* (massage) using medicinal herbs can reduce fever, and heal muscle and joint pain and weakness. In addition, massage can increase blood flow so that the swelling of the spleen decreases and the headache subsides. Massage will be successful if the patient sweats. Medicinal ingredients for massaging are divided into two, namely those from 'cold' plants and 'hot' plants. The 'cold' plants are used to reduce heat by absorbing heat from the body. Some 'cold' plants are *malaka futin*, *feu*, *fuka*, and *lakaur*. The 'hot' plants are used to increase body temperature so that body temperature becomes high and then dries up in line with decreasing body temperature. Some 'hot' plants are *knuan*, *lisa mutin*, *lisa mean*, and *masimanas kee*.

The bathing (*haris*) is usually done along with massage. *Sukaer*, *koya*, *fafok*, *blidin lotu*, *kala mean*, *kabasa*, and *bubur* are some plants in soaking water for bathing. The patient usually soaks in water to lower body temperature. Some plants are used as soaking water for bathing and the hot steam from the plants is inhaled. These plants are *ata malae*, *ata bot*, *ai lakar*, and *badut malaka mutin*. The plant is boiled and the hot steam is inhaled. Then the warm water is used for bathing.

The method of treatment by attaching the herb to the waist (*taka kok*) is done to relieve swelling of the spleen. The blended plant is affixed to the left waist called *tapel*. *Ma'ut*, *fuka*, *dila*, *baulenuk*, *fuk*, *tateka*, *liman tohar*, *mamunus*, and *kulu* are the plants for this treatment. These plants contain anti-inflammatory substances to reduce swollen lymph.

Internal treatment is done by drinking a concoction made from the Malaria medicinal plant. The concoction is called *hemu aitahan* or *hemu kwa*. The oral preparations are boiling, pounding, squeezing, and eating raw. Boiled plants are *dila*, *fuka*, *lakaur*, *kabasa*, and *krui*. The pounded

plant is *besak*. The squeezed plant is *bria fuik*. Mahogany seeds are a raw plant that is used orally.

Malaria treatment is typically provided by a *Makdok* or *doc* in the Tetun community. Malaria treatment is based on symptoms that appear separately. If the symptom is fever, the medicine given is a fever-reducing plant. If the spleen begins to swell, the patient will be asked to attach a *tapel* to the left waist. The more severe the symptoms of Malaria, the more complex the treatment given that can be seen from the more medicinal plants used and the mode of preparation is more than one.

Malaria treatment can be done by spraying (*hakbut*). The shaman (*makdok*) chews medicinal plants, usually betel nut, then spit it out to the patient. In this process, the shaman recites a prayer or incantation to the patient. The patient's recovery depends on the magical power of the shaman sprayed. There is a belief that the patient's recovery is determined by the compatibility of the shaman's saliva (*kaban*) with the medicinal plants he chews. In fact, in some cases, medicinal plants are used only a little or just a formality to cure patients.

In the process of treating malaria, there is a ritual of taking medicinal plants and completing treatment. The ritual of taking medicinal ingredients is carried out by offering permission from the owner of the material (medicinal plants). The Tetun people believe that medicinal ingredients are owned by nature or God (unseen power). There is no standard procedure for taking materials. The ritual is carried out based on consideration of whether the patient's illness is severe or not. In this case malaria with mild symptoms such as fever, there is no need for a ritual of taking materials. However, if the symptoms of malaria are severe, the healer will perform a ritual of taking medicinal ingredients. The ritual of taking is done by reciting a prayer or mantra before taking medicinal ingredients (medicinal plants). The prayer contains a request to nature to give "strength" to medicinal ingredients so that medicine becomes efficacious to heal patients. When the patient has recovered, a ritual is performed to restore the power to nature.

The ritual after the patient recovers from the disease is called *kasu* or *hakasuk*. In some places north of Belu Regency it is called *hakoluk*. The lexicon *kasu*, *hakasuk*, or *hakoluk* means to let go or to release. The meaning of this ritual is a sign that there is no 'relationship' between the patient and his illness. In this ritual, animal offerings are made to God or nature as a sign of gratitude for the patient's healing. The end of the relationship between the patient and the disease is carried out by throwing away items used when the patient is sick, for example, clothes, mats, pillows, plant medicines used, etc. Whether or not the ritual is necessary depends on the severity of the disease. Malaria is considered a mild disease so there is no need for an impromptu ritual of completing treatment. However, some healers think that this ritual needs to be done to restore the natural power taken in the form of medicinal materials (medicinal plants) so that the power can be used again to treat other patients. The return of this power is a continuation of the ritual of taking materials, it is like returning the loan of nature's power to heal the patient.

The findings related to the role of traditional healers in traditional medicine in the community are in line with the study of Elliot et al [16]. Their findings reveal that the Lao people know *ya pheun meuang* or shaman who also plays a role in treating Malaria using traditional medicine. The *Ya pheun meuang* is placed in the hospital to take care of the patient with spiritual rituals. This study also contributes to enriching the previous studies that have been carried out by Taek

et. al [1] because this study emphasizes the aspects of the lexicon of medicinal plants and medicinal practices as the linguistic and cultural treasure of the Tetun people.

#### **4 Conclusion**

Based on the findings and analysis, it can be concluded that the Tetun community has knowledge of the lexicon of traditional medicine by utilizing medicinal plants to treat Malaria. This knowledge is known and found from 97 lexicons of medicinal plants for malaria in the form of nouns consisting of 50 lexemes in the form of words and 47 lexemes in the form of phrases. The Tetun people use parts of medicinal plants, such as the leaves, roots, stems, seeds, tubers, rhizomes, bark, fruit, cloves, and all parts to treat Malaria patients. The mode of administration (how to process the medicine) is decoction, boiling, paste, and paste with coconut oil. The mode of preparations (how to use the medicine) are drinking, massaging, bathing, massage, inhalation, and cataplasm. The lexicon of medicinal plants is inseparable from the lexicon of malaria prevention, symptoms of malaria, and treatment of malaria. The Malaria medicinal plant name lexicon, prevention lexicon, and Malaria treatment practice and ritual lexicon are tools for recording and storing local knowledge and local wisdom of the Tetun people. This local knowledge is not only a cultural wealth but also a linguistic treasure that needs to be preserved by teaching it to the younger generation through education so that this abundant knowledge and local wisdom do not vanish. Besides, the research is limited . because there are other medicinal plants that need to be investigated for other diseases.

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