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Utilization of Medicinal Plants by the Tapos Village Community, Cijeruk District, Bogor Regency

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ABSTRACT

The diversity of medicinal plant species in Tapos Village has the potential to be developed. However, studies on medicinal plants are still limited. This study aimed to inventory the types of ethnophytomedica, their efficacy, and their utilization by residents of Tapos Village, Cijeruk District, Bogor Regency. This research is expected to provide a reference for further research and efforts to increase public understanding of medicinal plants. Data were collected through several stages: literature study, observation, unstructured interviews, and documentation. The results of this study showed that as many as 39% of the 99 types of medicinal plants were dominated by herbal habitus. The most widely used parts are the leaves (60 %) and cultivated medicinal plants (59 %). Most types of plants are used to cure a group of gastrointestinal diseases, with as many as 23 types of plants. The people of this village maintain local wisdom in utilizing medicinal plants.

Keywords: Ethnophytopharmaca, medicinal plants, Tapos Village

INTRODUCTION

Indonesia has abundant natural wealth with various cultures and tribes that maintain customs and traditions in the use of natural resources. According to Jumiarni and Komalasari (2017), out of 30000 types of plants in Indonesia, 7000 types have the potential to be medicinal plants, and only about 200 types of plants have been used as traditional medicines. Based on the work of Harmida *et al.* (2011), Indonesians have used plants as herbal ingredients for the treatment of health problems. This has been known for a long time in various ways. Knowledge about the use of medicinal plants in traditional medicine that is closely related to local customs or traditions and culture is called ethnophytomedika (Zuhud *et al.* 2009).

Tapos Village is one of the villages in Sukaharja Village that is closest to the forest boundary of Mount Halimun Salak National Park (TNGHS). The location close to the forest gives this village high and diverse potential for biological resources, including medicinal plants.

Much research has been conducted on the use of plants by the community. Arbiastutie *et al.* (2017) conducted an inventory of medicinal underplants in Gunung Gede Pangrango National Park, West Java Province, and obtained 83 types of medicinal plants from 45 families. It is possible that there is still much information on the efficacy of medicinal plants from local knowledge that has not been documented and scientifically tested.

The use of medicinal plants by the community is decreasing with the emergence of various types of commercial and synthetic drugs, and the public's understanding of and interest in medicinal plants is now decreasing because they prefer chemical treatment. This threatens the preservation and loss of information regarding medicinal plants in the community. Based on the study by Efremila *et al.* (2015), in order for medicinal plants to be the main choice to cure diseases, they must be socialized to the entire community. Understanding the potential of medicinal plants for the community is expected to maintain their local wisdom and preserve medicinal plants.

This study aimed to identify the diversity of medicinal plant species, efficacy, and utilization by the people of Tapos Village in Cijeruk District, Bogor Regency. In addition, information from the people of the local community and literature studies of scientific research results related to the efficacy of medicinal plants will be compared.

METHODS

Place and Time of Research

Empirical data collection of medicinal plants was carried out in Tapos Village, Sukaharja Village, Cijeruk District, Bogor Regency, West Java, from April to July 2020. The literature review was conducted online from July to October 2020. A map of the research location is shown in Figure 1.

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Tools and Materials

The tools used in this study were cameras, writing stationery, and laptops. The materials used were map data of the area and geographical conditions of Tapos Village obtained from the Sukaharja Village Government.

Types of Data Collected

The types of data and information collected in this study included the general condition of the location, the potential of medicinal plants from local knowledge, the potential of medicinal plants from literature studies, and the local wisdom of the community in the use of medicinal plants. The data type, aspects studied, data sources, and methods are listed in Table 1.

Data Collection Methods

Literature review

Literature studies were conducted before and after the research was carried out. Prior to the research, literature study activities were carried out to obtain data on the general condition of the research location and the types of medicinal plants in the research location. Subsequent literature studies were carried out to obtain secondary data related to data in the field for potential analysis and comparison in the writing of the final project.

Observation

Observations were carried out to obtain actual data and information about the general condition of the research location and the potential of medicinal plants used by the community. Observations were made in the garden and around the yard of the house (Figure 2). The type of data obtained is in the form of primary data, namely data obtained from the first source or original source, namely through informants, documentation, and observations on the object being studied.

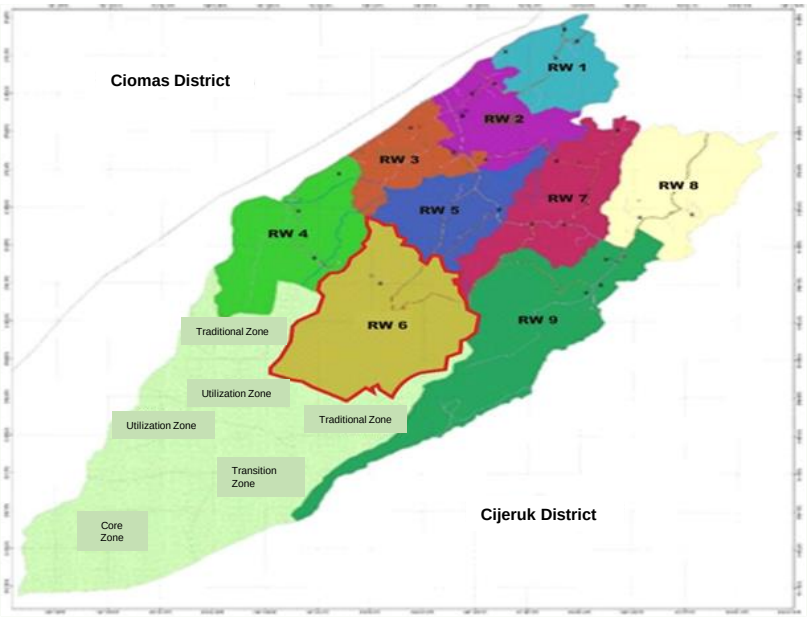

Figure 1 Research location in Tapos Village (RW 6) Sukaharja Village (Sukaharja Village Government 2018).

Table 1 Types of data collected

Type of data	Aspect studied	Data source	Method
General conditions of the research site	Regional status and physical condition of the area	Sukaharja Village Office and the internet	Literature studies
The potential of medicinal plants from local knowledge	Types of medicinal plants around Tapos Village: local name, scientific name, parts used, properties, how to use	RW 6 Community/Tapos Village, Sukaharja Village and libraries	Observations, in-depth interviews, and literature studies
Potential of medicinal plants from literature studies	Local name, scientific name, part of the plant studied, and uses	Literatuures	Literature studies
Local wisdom of the community in the use of medicinal plants	Forms of local wisdom in the use of medicinal plants	RW 6 Community/Tapos Village, Sukaharja Village	In-depth interviews

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Figure 2 In-depth interviews with traditional midwife (*paraji*) and people who know the use of medicinal plants.

Unstructured interviews

Unstructured interviews are free interviews in such a way that the researcher does not use interview guidelines that have been systematically and completely arranged for data collection. The interview guidelines used are only in the form of outlines of problems that will be asked in the form of open-ended questions as one of the data collection techniques (Nurwega 2015). The informants in this study were selected using snowball sampling. The snowball sampling technique is a method to identify, select, and take samples in a network or chain of continuous relationships. The category of informants who became the sample of this study was *paraji* (traditional midwives) and the community that knew about the use of medicinal plants in Tapos Village (Figure 2). The outlines of the problems that will be asked are the types, efficacy, and how to use medicinal plants according to the culture of the local community. The data from this observation was used as primary data for the research.

Documentation

Documentation is a data collection technique aimed at the research subject. The documentation in this study is more about collecting supporting documentation for the required research data. For this study, the documentation needed was the identification of medicinal plants, the parts used for treatment, and how to process medicinal plants until they are ready for use.

Data Analysis

Data Analysis on Medicinal Plant

The data of medicinal plants are compiled and grouped based on: (1) classification based on habitus, (2) habitat description, (3) classification based on the part used, (4) description based on its use, (5) description of how it is used, (6) classification of cultivated or wild medicinal plants, and (7) classification based on disease groups and the number of each species.

Diversity of Medicinal Plants

The medicinal plants used come from several species with several kinds of habitats, the parts of the plant used, and the status of cultivation. According to Tjitrosoepomo (1988), the habitat of various plant species is as follows:

a) Tree is a tall woody plant with a single clear trunk and branches far from the ground level.
b) Shrub is a woody plant that is not very large, and branches close to the ground or in the ground.
c) Bush is a woody plant that groups with very many members that form clumps, grows on the ground surface and can reach 1 m in height.
d) Herbage is a non-woody plant with soft and juicy stems.
e) Liana is a woody plant, whose trunk creeps / climbs on other plants.
f) Epiphytes are plants that rely on other plants as a place to grow.

Analysis of the Use of Medicinal Plants by Community

The determination of the number of species based on disease groups and their use is presented in Table 2.

RESULTS AND DISCUSSION

Diversity of Medicinal Plants

Local communities have their own uniqueness in utilizing plants in their surroundings, in accordance with the knowledge of ancestral heritage and biodiversity. Based on the results of observations and interviews with residents of Tapos Village, it is known that a total of 99 types of medicinal plants is used. It is scattered in the yards of houses, gardens, and forests. These medicinal plants are grouped into several types of habitats, parts of the plants used, and cultivation status. Eleven of these medicinal plants are not yet known for the scientific names. Full information about local

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Table 2 Classification of disease groups and types of diseases (Zuhud *et al.* 2009)

Disease groups	Type of Disease
Diseases of the gastrointestinal tract	Digestive disorders
Head sickness and fever	Headache, dizziness, fever in children, fever in adults.
Respiratory tract diseases	Cough, tuberculosis, cold, asthma, sore throat.
Skin disease	Scabs, ulcers, pimples, ringworm, eczema, ulcers, smallpox, measles, itching, swelling, purulent wounds, scabies, athlete's foot, and others.
Oral diseases	Thrush, bad breath, and peeling.
Dental diseases	Swollen gums, cavities, and infections.
Wound treatment	Wounds, burns, new wounds and other injuries.
Kidney diseases	Kidneys, kidney disease, kidney failure, kidney stones, urinary stones.
Heart and blood vessel disease	Heart disease, stroke, heart palpitations, high blood pressure, and heart-related ones.
Blood circulatory disorders	Lack of blood, dirty blood, blood cancer, blood purifier, blood supplier, lack of blood in pregnant women, and those related to lack of blood
Venereal diseases	Genital disorders, syphilis, gonorrhea (pus urination).
Women-specific diseases	Vaginal discharge, late menstruation, too much menstrual blood, not having periods, and those related to female diseases.
Jaundice	Liver, jaundice, liver disease, swollen liver.
Malaria	Malaria, malarial fever.
Eye diseases	Red eyes, infections.
Muscle and joint diseases	Seizures, abdominal cramps, muscle pain, rheumatism, low back pain, muscle pain, sprains, and those related to muscle diseases.
Lower digestive system diseases	Difficulty urinating, hemorrhoids, urinary tract, difficulty defecating, blood urine, night sweats.
Hair and face care	Hair washing, hair care, face powder.
Tonic	A powerful drug, tonic, tonic, appetite enhancer, increases digestive enzymes.
Pregnancy and childbirth care	Miscarriage, care before/after childbirth, nipples, uterine fertilization, swollen milk, breast milk etc.
Birth control	Birth control contraceptives, limiting pregnancy, infertility, pregnancy thinning
Bone fractures	Bone fractures, sprains.
Antidote to poison	Antidote to animal poison, insect bites, food poisoning.
Others	Spleen, swelling, beriberi, sore nails, sleeping pills, sedative rubs, and those not listed above.

names, species, cultivation status, and habitat descriptions can be seen in Table 3.

The location and natural conditions of Tapos Village, which is still preserved, as well as its location close to the forest of Mount Halimun Salak National Park, make the existence of medicinal plants very diverse and easy to obtain. Among these medicinal plants, there are several plants that are already known and widely used, and there are also several types of plants that are not yet known, or their use is still limited among the people of Tapos Village only. Herb habitat s is the dominant type of habitus in the village, accounting for approximately 39%. This is because herbaceous habitus is easier to grow, and some can grow naturally. According to Rahman *et al*. (2019), habitus is a type of herb that grows easily in various habitats. The people here used more leaves for treatment (60 %). This is because leaves are easier to obtain than other parts of plants, and leaves are plant organs that are always available in plants. In terms of conservation, leaf picking does not interfere with plant preservation (Rahman *et al.* 2019). The use of leaves as medicinal ingredients does not have a negative impact on plant survival, while the parts that need to be restricted in their use are roots and stems, as they can cause plant death (Jafar and Djollong 2018; Mulyani *et al*. 2020).

Some medicinal plants used by the village people grow wild or are cultivated by the community. Based on the results, 59% of the total types of medicinal plants were cultivated. Martono *et al.* (2018) reported that cultivation of medicinal plants aims to meet the daily needs of families so that they are easy to obtain if at any time they need medicine for sick families. Most of these are medicinal plants and functional foods that are cultivated for food needs and have health benefits.

Potential Efficacy of Medicinal Plants from Community Knowledge

The use of medicinal plants based on disease groups was classified into 24 groups (Table 4). The disease group with the most medicinal plant species was the gastrointestinal disease group with 23 plant species. There are five types of plants that are easiest to find and are often used by the community in the village, used to treat minor diseases that are commonly experienced by people daily. These are avocado (*Persea americana*), cloves (*Syzygium aromaticum*), *harendong bulu (Clidemia hirta* (L.) D.Don), cat whiskers (*Orthosiphon stamineus* B.), and nutmeg (*Myristica fragrans*), that have been widely studied.

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Table 3 Types, parts of plants used, benefits, and how to use medicinal plants in Tapos Village

Local name	Scientific name	Habitus	Status	Habitat description
Alang-alang	*Imperata cylindrica* (L)	Herbage	W	Growing wild in open fields or roadsides
Alpukat	*Persea americana*	Tree	C	Planted in gardens and yards, growing at 1-1000 m above sea level
Amis mata	*Ficus montana*	Shrub	W	Grows wild in gardens, rice paddy fields and rivers
Angkrik (garut)	*Maranta arundinaceae*	Herbage	C	Planted in the garden
Angsana	*Pterocarpus indicus*	Tree	C	Growing wild or grown in the garden
Antanan (pegagan)	*Centella asiatica* (L.) Urban	Herbage	W	Growing wild on a fence
Aren	*Arenga pinnata* Merr.	Tree	C/W	Grown in forests, grown in temperate to wet climates
Babadotan	*Ageratum conizoides* L.	Herbage	W	Grows wild in yards and open gardens
Baluntas	*Pluchea indica* L.	Bush	C	Planted in the yard, easy to grow in tropical climates
Bawang-bawangan	-	Herbage	C	Planted in yards, temperate climates
Bayam merah	*Amaranthus gangeticus* L.	Herbage	C/W	Planted in the yard, can ggrow in dry conditions
Belimbing	*Averrhoa carambola*	Tree	C	Planted in the yard, easy to grow in tropical climates
Begonia	-	Herbage	W	Grows wild in moist forests, at an altitude of about 1000 m above sea level
Bidara (Sabang getih)	*Hemigraphis colorata*	Herbage	C	Planted in the yard, grow in temperate climates
Binahong merah	*Basella alba*	Herbage	C	Planted in the yard vines on the host tree or fence
Cabai merah	*Capsicum annum* L.	Shrub	C	Planted in gardens and yards
Capituher	*Mikania scandens*	Liana	W	Growing wild in forests and yards
Cecenet	*Physalis angulata*	Bush	W	Grows wild in open fields, gardens and roadsides
Cengkeh	*Syzygium aromaticum*	Tree	C	Grown in gardens and yards, it is easy to grow in tropical climates
Dadap	*Erythrina variegata*	Tree	C/W	Easy to grow in a humid place
Durian	*Durio zibethinus*	Tree	C	Grown in gardens and yards, it easily grows in tropical climates
Handeuleum	*Graptophyllum pictum*	Shrub	W	Grows in open land such as yards
Hanjuang merah	*Cordyline fruticosa L.A. Cheval*	Shrub	C	Planted in the yard
Hantap	*Sterculia oblongata R. Brown*	Tree	W	Growing wild in the forest
Hareuga	*Bidens pilosa L.*	Herbage	W	Grows wild in gardens, yards and between rocks
Harendong Besi	*Melastoma affine D. Don*	Shrub	W	Grows wild in the open field around the garden
Harendong Bulu	*Clidemia hirta*	Shrub	W	Growing wild in open gardens and yards
Jahe	*Zingiber officinale*	Herbage	C	Planted in open gardens and residents' yards
Jambu Air	*Syzygium aqueum*	Tree	C	Grown in gardens and yards, it is easy to grow in tropical climates
Jambu biji	*Psidium guajava*	Tree	C	Grown in gardens and yards, it is easy to grow in tropical climates
Jambu mete	*Anacardium occidentale*	Tree	C	Planted in the garden
Jamolok (Sintrong)	*Crassocephalum Crepidioides*	Herbage	W	Grows wild in gardens and yards, easy to grow in open land
Jawer Kotok	*Plectranthus scutellarioides*	Bush	C	Planted in the yard of the house for ornamental plants
Jengkol	*Archidendron pauciflorum*	Tree	C	Planted in the garden
Jeruk nipis	*Citrus aurantifolia*	Shrub	C	Planted in the yard and in the field
Kalingsir	*Clinacanthus nutansini*	Shrub	C	Planted in the yard of the house
Kapulaga	*Amomum compactum*	Herbage	C	Planted in the garden, on the edge of the path

Based on the results of observations and interviews,

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Table 3 Types, parts of plants used, benefits, and how to use medicinal plants in Tapos Village

Local name	Scientific name	Habitus	Status	Habitat description
Katuk	Sauropus androgynus	Shrub	C	Grown in the garden, grow in quite humid conditions
Kayu manis	Cinnamomum verum	Tree	C	Planted in the garden, able to grow in dry conditions
Kecombrang	Etlingera elatior	Herbage	C	Planted in gardens and yards
Kedondong pager	Spondias pinnata	Bush	C	Planted in the garden
Kelapa Hijau	Cococ nucifera L.	Tree	C	Planted in gardens and yards
Keras Tulang	-	Shrub	W	Grows wild or planted in gardens and rice fields
Kate Mas	Euphorbia heterophyla L.	Herbage	W	Grows wild or planted in gardens and rice fields
Kibaus	Clerodendrum bungei	Shrub	W	Grows wild in gardens and grows in yards
Kiencok	-	Shrub	C	Planted in the yard, able to grow in dry conditions
Kiiga	Walking iris	Herbage	C	Planted in the yard
Kipiit	Maesa perlarius	Shrub	W	Growing wild in the forest
Kirinyuh	-	Bush	W	Grows wild in forests and in gardens
Kisaat	Valeriana officinalis L.	Herbage	C	Planted in the yard, grown in moist conditions
Kitolod (Korejat)	Isotoma longiflora	Herbage	C	Planted in the yard, grown in moist conditions
Kiurat	Plantago mayor	Herbage	W	Growing wild in the yard
Kopi	Coffea arabica L.	Shrub	C	Planted in the garden
Kumis Kucing	Orthosiphon stamineus B.	Herbage	C	Planted in gardens and open yards
Kunci	Boesenbergia rotunda	Herbage	C	Grown in the garden, grows in quite humid conditions
Kunyit	Curcuma longa	Herbage	C	Planted in gardens and yards, humid conditions and shaded by other plants
Labu Siam	Sechium edule	Liana	C	Planted in the garden, vines on artificial fences
Lempuyang	Zingiber zerumbet	Herbage	C	Planted in gardens and yards, the conditions are quite humid
Lengkuas	Alpinia galanga	Herbage	C	Planted in gardens and yards
Lidah Buaya	Aloe vera	Bush	C	Planted in the yard, the conditions are quite humid, for ornamental plants
Mahoni	Swietenia mahagoni	Tree	C	Growing in forests and gardens
Markisa	Passiflora edulis	Liana	C	Planted in gardens and yards, vines in the shade of artificial fences, grow in moderate conditions
Monyennyen	-	Herbage	W	Growing wild in forests and rice fields
Murbei	Morus alba L.	Shrub	C	Planted in open yards
Nanas Hijau	Ananas comosus (L.) Merr.	Herbage	C	Grown in open gardens, withstands dry conditions
Nangka	Artocarpus heterophyllus	Tree	C	Planted in gardens and yards
Pace (mengkudu)	Morinda citrifolia L.	Tree	C	Planted in gardens and yards
Pacing	Costus speciosus	Herbage	C/W	Planted in yards and gardens, the conditions of the place are humid and shady
Pakis sayur	Diplazium esculentum	Herbage	W	Grows wild in gardens and forests, in moist and shady conditions
Paku Rane	Selaginella willdenowii	Herb	W	Growing wild in gardens and forests
Pala	Myristica fragrans	Tree	C	Grown in gardens and yards, growing in humid conditions
Panglay	Zingiber purpureum roxb	Herbage	W	Grows wild in gardens and forests, humid and shady conditions
Parahulu	-	Herbage	W	Grows wild in forests in humid conditions
Pare	Momordica charantia	Liana	C	Planted in the yard, vines in the shade
Pepaya	Carica papaya	Tree	C	Planted in the yard
Pohpohan	Pilea melastomoides	Herbage	C	Planted in the garden

Based on the results of observations and interviews,

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Table 3 Types, parts of plants used, benefits, and how to use medicinal plants in Tapos Village

Local name	*Scientific name*	Habitus	Status	Habitat description
Pungpurutan	-	Shrub	W	Growing wild in forests and rice fields
Putri malu	*Mimosa pudica* L.	Bush	W	Growing wild in the open
Rebung	*Dendrocalamus asper*	Tree	C/W	Planted and grown wild in the garden

Remarks: C = Cultivated and W = Wild.

Table 4 Number of medicinal plant species to treat various disease groups from the knowledge of the Tapos Village Community

Disease group	Number of medicinal plant species
Diseases of the gastrointestinal tract	23
Head sickness and fever	14
Respiratory tract diseases	8
Skin diseases	5
Oral diseases	1
Dental diseases	3
Wound treatment	5
Kidney disease	1
Heart and blood vessel diseases	13
Blood circulatory disorders	4
Venereal diseases	0
Women-specific diseases	2
Jaundice	0
Malaria	0
Eye diseases	2
Muscle and joint diseases	16
Lower digestive system	4
Hair and face care	3
Tonic	10
Pregnancy and childbirth care	8
Birth control	0
Bone fractures	1
Antidote to poison	4
Others	5

Based on the results of observations and interviews, the people of the village know the efficacy of the five medicinal plants and how to process them into herbs. The most used part is the leaf. The types of diseases known to the public are generally mild and commonly experienced daily, namely diarrhea, ulcers, toothaches, wounds, and high blood pressure. Meanwhile, the results of scientific research from the literature on the five plants show that the parts of the plants studied, and their properties are more diverse, among which are the most dominant as antioxidants, antibacterial, and antidiabetic.

According to the community, there are several medicinal plant properties that are in line with the results of scientific research. Most of these are diseases caused by bacterial infections. Diarrhea is caused by a bacterial infection, one of which is *Escherichia coli*. This shows the community's empirical knowledge about avocado leaves and *harendong bulu*, which are efficacious for curing diarrhea. This is in line with the results of scientific research showing that avocado leaves (*Persea americana)* can inhibit the growth of pathogenic bacteria in digestive organs (Andriani *et al.* 2016; Wulandari *et al*. 2019).

Harendong bulu leaves are used by local communities to accelerate wound healing. This is in line with scientific research showing that the leaves can inhibit the growth of *the Staphylococcus epidermis*, which is a bacterium that can cause skin infections (Ambarwati 2021). In addition to the leaves, the fruit part of this specific plant is used by the local community to treat vomiting (Simanjorang 2018). The plant is also used as a tonic by the people of the traditional Cikondang village, Pangalengan, of West Java (Kodir *et al.* 2017).

Clove leaves are used by the local community to relieve toothache. The results of this study showed that *Syzygium aromaticum* clove leaves can overcome dental caries (Suhendar and Sogandi 2019). Clove leaves can inhibit the growth of *Streptococcus mutans*, which causes dental caries. The results showed that clove leaves could inhibit *Escherichia coli* and *Staphylococcus aureus,* causing gastrointestinal infections (Ramadhani *et al.* 2020).

Cat whisker (*Ortosiphon aristatus*) leaves are used by the Tapos villagers to urinate and treat back pain. Based on previous research, the leaves have analgesic or pain-reducing effects in male rats (Nurfitri *et al.*

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2021). Another study showed that the leaves have antihypertensive activity (Ohashi *et al*. 2000).

Nutmeg (*Myristica fragrans*) leaves are used by the community to treat diarrhea. Research has also shown that the leaves have antibacterial activity against *Methicillin-resistant Staphylococcus aureus* (Nurjannati 2018). The antibacterial ability of plants is due to the presence of secondary metabolites, such as alkaloids, flavonoids, saponins, tannins, and polyphenols. Each compound has its own functions. Alkaloids can cause cell death by disrupting cell wall formation. Flavonoids interfere with the integrity of bacterial cell membranes by forming extracellular protein complexes. Saponins can increase the permeability of the cell membrane, thereby causing cell lysis. Tannins can shrink the cell wall or membrane, thereby inhibiting the growth of bacterial cells. Polyphenols can damage cell walls and precipitate cell proteins, in addition to being toxins in the protoplasm (Lenny 2016).

According to Arjadi and Susatyo (2010), secondary metabolite compounds can lower blood glucose levels. Alkaloids function to regenerate damaged pancreatic β-cells and inhibit enzymes that play a role in glucose formation. Flavonoids and saponins function as antioxidants that protect the pancreas from free radicals. Tannins constrict the epithelial membrane of the small intestine, thereby reducing the rate of increase in blood sugar (Monica 2006). Steroids function as antioxidants that protect the pancreas from free radicals.

Source of Medicinal Plants in Tapos Village

Medicinal plants live in a variety of habitats, scattered in garden areas, yards, and forests. Most plants can grow in multiple habitats, and a small number grow in one habitat (Desuciani 2012). Based on the Lawalata IPB (2019) findings, as many as 47 species are medicinal plants that are deliberately planted in the yards of residents' houses, 39 species are deliberately planted around gardens and forests, 14 species grow wild in yards, and 34 species grow wild around gardens/forests.

Based on these data, it is known that people have started planting different types of medicinal plants in the yard (Figure 3a). It has become easier for people to obtain medicinal plants when needed. Not only are plants deliberately planted in the yard, but some are wild plants or grow on their own. In line with what was revealed by Jalius and Muswita (2013), the types of plants that are widely used as medicinal plants come not only from natural forests, but also from ecosystems that have received a lot of human touch, especially shrubs and farm areas. Some types of medicinal plants still grow wild in garden areas or are deliberately planted in gardens because of limited yard land (Figure 3b).

How to Utilize Medicinal Plants by the Community

Its location close to the forest makes the location of Tapos Village quite difficult to access and far from health facilities and other public facilities. Therefore, some people still depend on what they get from the surrounding environment, one of which is traditional medicine. The people utilize and process medicinal plants as herbs to prevent, treat, and maintain body stamina to support their daily activities (Figure 4a).

The people use medicinal plants by consuming them directly, without being processed or applied as external medicine. In addition, some medicinal plants are boiled or brewed first. This is in line with the research of Musaicho *et al.* (2021), which explains that the community in Sebalo Village, Bengkayang District, Bengkayang Regency, West Kalimantan, utilizes medicinal plants by rubbing, drinking, spreading, pasting, and eating (consumed directly). Puspitasari and Prayogo (2016) and Sari *et al.* (2015) also reported that boiling is a common method used by the community to consume plant-derived medicines. This is because the boiling method is easy to perform and requires only simple tools. The results of Leonardo's (2013) research in Sekabuk Village, Sadaniang District, Pontianak Regency also stated that the most widely used method of processing medicinal plants by the community was boiling for 25 of the 51 types of medicinal plants found.

In Tapos Village, several community leaders are experts in traditional medicine and village midwives. The community calls the village midwives *paraji* (Figure

Figure 3 Sources of medicinal plants in Tapos Village. (a) house yards and (b) gardens.

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4b). *Paraji* is generally a local woman who inherits traditional medicine knowledge from family generations; they work for people who need medical help, more specifically, when there are female diseases. *Paraji* usually grows various kinds of medicinal plants or looks for medicinal plants that grow wild in the forest.

Each type of plant has its own way of processing and use according to local knowledge. Information about the efficacy of medicinal plants is mostly obtained from adult to elderly communities. Some people still rely on *paraji* services to help them obtain alternative medicine. *Paraji* is a person who has close interaction with natural resources and inherits the traditional lifestyle of his ancestors. *Paraji* grows various medicinal plants in the yard. However, some types of plants are still obtained from wild gardens or forests. Therefore, *paraji* stores various types of dried medicinal plants as supplies if needed at any time. The drying process is carried out so that medicinal plants can withstand long-term storage. The drying process is usually performed in the sun or roasted using traditional equipment (Figure 5). In processing and concocting medicinal plants, *paraji* maintains the traditional way. This process is manual and requires simple equipment. The easiest way to use medicinal plants is to consume them directly without being processed or applied to external drugs. In addition, there are medicinal plants that need to be boiled or brewed first to obtain the water extract. However, in the need for the treatment of certain diseases, *paraji* needs to incorporate several medicinal plants into herbal medicine (Figure 6a). The medicinal plants that have been concocted are then mashed individually using a traditional mash tool. The

Figure 4 Culture of the use of medicinal plants in Tapos Village (a) People who use medicinal plants to maintain stamina, (b) traditional midwife (*paraji*).

Figure 5 Traditional process of drying medicinal plants. (a) roasted in the oven and (b) sun-dried.

Figure 6 The process of making herbal medicine, (a) *paraji* concocting medicinal plants that have been dried, (b) the process of mashing medicinal plants into powder

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process of refining medicinal plants is still traditionally performed (Figure 6b). Once all the ingredients are finely pounded, *paraji* brings all the ingredients together and adds a pinch of salt to add flavor.

CONCLUSION

The empirical use of medicinal plants in the Tapos Village community still exists and has not become extinct, so it can still be developed and documented. There are 99 types of medicinal plants in Tapos Village and are spread in the yards of houses, gardens, and around the forest dominated by herbaceous habitus by as much as 39%. The most used parts are the leaves (60%) and cultivated medicinal plants (59%). As many as 23 types of plants have been used to cure a group of digestive tract diseases. Local knowledge of the community regarding the potential efficacy of medicinal plants has been partially in line with the results of scientific studies. The local wisdom that is still maintained in the village is that the community still uses the services *of paraji* or village midwives, and the processing of medicinal plants is still carried out traditionally.

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