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Ethnobotanical study of antihypertensive medicinal plants in Sari Makmur Village, West Kalimantan, Indonesia

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Abstract. *Panjaitan RGP, Putri AD, Wahyuni ES, Ningsih K, Titin, Fitriawan D, Liangyue. 2025. Ethnobotanical study of antihypertensive medicinal plants in Sari Makmur Village, West Kalimantan, Indonesia. Biodiversitas 26: 3356-3366.* Hypertension is one of the leading causes of death worldwide, often going undetected due to its non-communicable yet fatal nature. One non-pharmacological treatment for hypertension is herbal therapy using medicinal plants. This study aims to inventory medicinal plants used to treat hypertension by the Malay community in Sari Makmur Village, Tekarang Sub-district, Sambas District, West Kalimantan, Indonesia. The research employed a qualitative descriptive method with a data triangulation technique, including interviews, observations, documentation, and the creation of a herbarium for plant identification involving five informants. The results show that there are 12 plant species used as antihypertensives by the community of Sari Makmur Village, including *bunga panyok* (*Catharanthus roseus*), *daun sop* (*Apium graveolens*), *engkudu* (*Morinda citrifolia*), *gerinang* (*Averrhoa bilimbi*), *kumis kucing* (*Orthosiphon aristatus*), *mahkota dewa* (*Phaleria macrocarpa*), *nangka belande* (*Annona muricata*), *patterwali* (*Tinospora cordifolia*), *pegage* (*Centella asiatica*), *salam* (*Syzygium polyanthum*), *sambung nyawe* (*Gynura procumbens*), and *telang* (*Clitoria ternatea*). The species most frequently mentioned by informants for treating hypertension were *nangka belande* (*A. muricata*) and *salam* (*S. polyanthum*) while the most used plant family was Apiaceae. The most utilized plant part was the leaf, and the most frequent method of preparation was boiling. These findings highlight the importance of preserving and supporting local conservation efforts as an alternative resource in the development of herbal medicines to ensure their sustainability.

Keywords: Hypertension, inventory, medicinal plants

INTRODUCTION

Hypertension is a leading global health issue characterized by consistently elevated blood pressure above 120/80 mmHg, increasing the risk of cardiovascular diseases such as heart failure and stroke (Liu 2019; Flack and Adekola 2020; Kim et al. 2020). The World Health Organization (2023) estimates that around 1.28 billion adults aged 30-79 suffer from this "silent killer," which often goes undetected (Davis et al. 2024; Muralitharan et al. 2024). Hypertension is influenced by unmodifiable factors (age, genetics, sex) and modifiable ones (diet, physical activity, smoking, alcohol intake, and obesity) (Mills et al. 2020; Trong et al. 2024). Treatment includes pharmacological approaches using antihypertensive drugs and non-pharmacological strategies such as healthy lifestyle changes, dietary modifications, and herbal therapy (Ilmiyah et al. 2022; Timsina et al. 2023). Herbal treatments are favored for their affordability, accessibility, and minimal side effects (Panjaitan et al. 2024a, b, c; Arief et al. 2023; Yiblet 2024).

Medicinal plants are those with active compounds in their roots, leaves, stems, fruits, or flowers, useful for therapy and drug development (Muyumba et al. 2021; Nursamsu et al. 2024). Their use is rooted in ancient healing traditions, preserved through generations and often reflected in local languages and customs (Marrelli 2021; Nursamsu et al. 2024). Medicinal plant use remains essential in areas with limited access to modern healthcare (Manzano et al. 2020), such as Indonesia, where communities still rely heavily on traditional medicine (Panjaitan et al. 2024a, b, c).

Indonesia's rich biodiversity and cultural heritage—exemplified by rituals like Robo-robo in Mempawah—highlight the role of medicinal plants in both daily and ritual life (Fathir et al. 2021; Husaini et al. 2022; Azizah et al. 2023; Gani et al. 2024; Surya 2024). The country's medicinal plant resources, including cinnamon, cloves, and nutmeg, have global recognition (Arozal et al. 2020; Cahyaningsih et al. 2021; Yayusman and Mulyasari 2024). Across Indonesian communities, medicinal plants are used for health, including hypertension (Jannaturrayyan et al. 2020; Adnan et al. 2022). Indonesia's traditional medicine practices encompass herbal remedies, spiritual healing, and other culturally embedded systems, both informal and government-recognized (Fatima 2023).

West Kalimantan in Indonesia, a province rich in biodiversity and cultural plurality, is home to various

ethnic groups, including Malay, Javanese, Chinese, and Bugis. In this region, the use of medicinal plants remains common (Panjaitan et al. 2020; Arbiastutie et al. 2021; Supiandi et al. 2021; Firmansyah 2023). Research in villages such as Jangkang Benua (Sanggau District) and Babane (Bengkayang District) has documented 40 and 26 species of medicinal plants, respectively, some specifically used for treating hypertension (Supiandi et al. 2021; Panjaitan et al. 2024a).

Sari Makmur Village in Tekarang Sub-district, Sambas District, West Kalimantan, is one such community that continues to use local flora for traditional healing. Most residents are farmers, and the village is ecologically rich and agriculturally fertile. Hypertension is one of the most frequently treated conditions in the area, and its high prevalence is linked to poor dietary habits, as reported by the Tekarang Health Center.

The dominant ethnic group in Sari Makmur is Malay, and although plant-based medicinal practices are common, documentation of specific species used remains scarce. Previous studies show that Malay communities in other Indonesian regions also rely on medicinal plants. In Tanjungpura (North Sumatra, Indonesia), galangal (*Alpinia galanga*), turmeric (*Curcuma longa*), *Kaempferia galanga*, and ginger (*Zingiber officinale*) are used in postpartum care (Yustika et al. 2022). In Kampar Kiri Hulu (Riau), cinnamon (*Cinnamomum burmanii*), coconut (*Cocos nucifera*), and cucumber (*Cucumis sativus*) support maternal health (Susandarini et al. 2021). Beyond Indonesia, Malay communities in Malaysia also use species such as *Clinacanthus nutans* for digestion, *Parkia speciosa* for diabetes, and *Psidium guajava* for gastrointestinal disorders (Ramli et al. 2021).

These patterns confirm that medicinal plant use among the Malay ethnic group is not only culturally significant but also regionally consistent across Southeast Asia. This study aims to document the antihypertensive plants used by the Malay community in Sari Makmur Village, including species names, plant parts used, and preparation methods. Such documentation is essential for preserving traditional knowledge, informing healthcare alternatives, and guiding sustainable resource use.

MATERIALS AND METHODS

Study area

This research was conducted in Sari Makmur Village, Tekarang Sub-district, Sambas District, West Kalimantan Province, Indonesia (Figure 1). The village covers an area of 702.04 hectares and is divided into four hamlets: Darussalam Hamlet, Harapan Hamlet, Parit Lintang Hamlet, and Serang Hamlet. According to interviews with the officials of Sari Makmur Village on September 20, 2024, the population of Sari Makmur Village is 1,650 people.

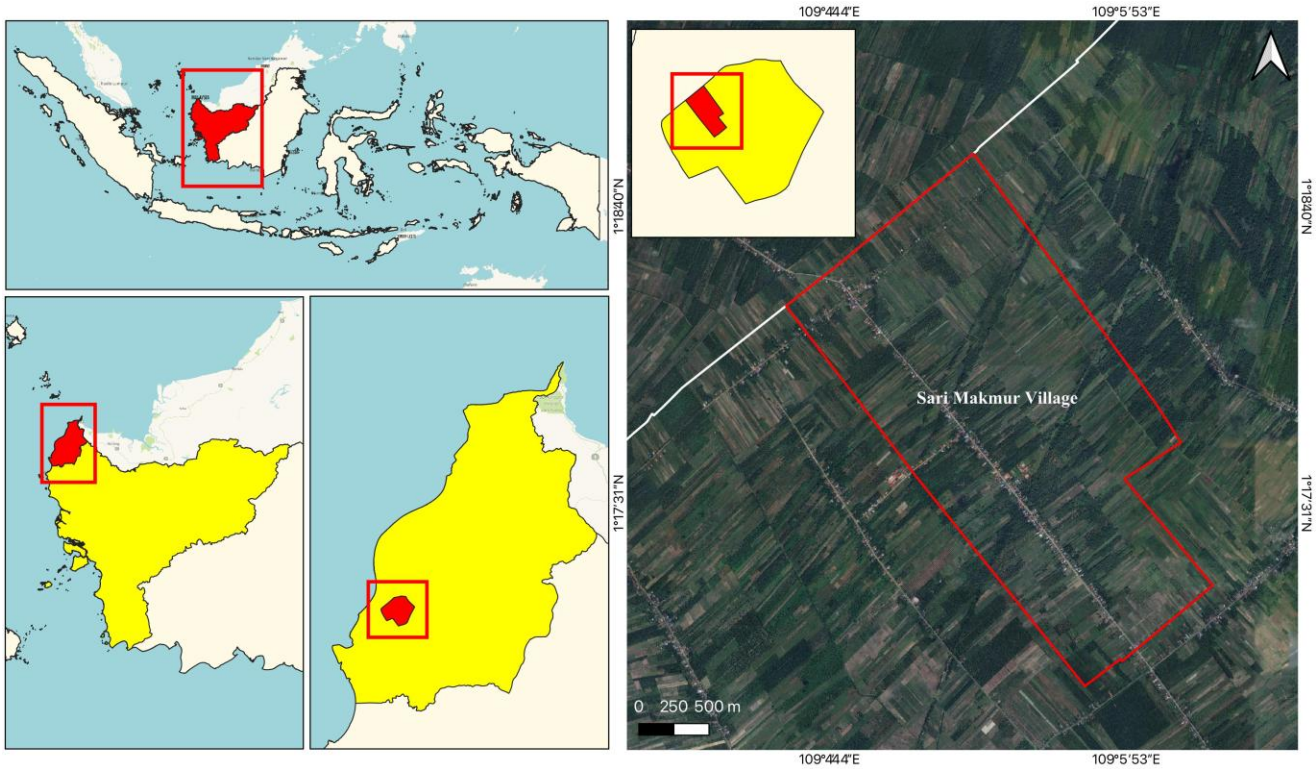

Figure 1. The map of Sari Makmur Village, Tekarang Sub-district, Sambas District, West Kalimantan, Indonesia

Data collection

This study was conducted in accordance with research ethics principles, wherein all informants gave their voluntary consent to participate after receiving a comprehensive explanation of the objectives, methods, benefits, and their right to withdraw at any time without penalty. The main focus of this study is to inventory medicinal plants used for the treatment of hypertension, without addressing other uses of these plants. Data collection was carried out using a triangulation technique, which combines methods of interviews, observation and documentation (Lestari 2022; Panjaitan et al. 2024a, b, c), and the creation of herbarium for plant identification (Panjaitan et al. 2024a, b, c). The informants in this study were selected using a purposive sampling technique, based on specific criteria—namely, residents of Sari Makmur Village who possess knowledge and experience in the use of traditional medicinal plants. From this selection process, five informants were chosen, all of whom are traditional healers with expertise in their field. Data saturation was reached with the five informants because the information obtained was similar or repetitive. All informants are of Malay ethnicity and reside in Sari Makmur Village. The five informants consisted of four women and one man, with ages ranging from 54 to 68 years. Interviews were conducted with traditional healers from the Malay ethnic group in Sari Makmur Village using an interview guide. The purpose of the interviews was to gather information about the names of medicinal plants, the parts of the plants used, and the methods of processing the plants for hypertension treatment. The results of the interviews were then recorded, followed by field observation and documentation. Observations were made to collect and document plant samples. The identification process was carried out at the Biology Laboratory, Faculty of Mathematics and Natural Sciences (MIPA), Universitas Tanjungpura, Pontianak, West Kalimantan, Indonesia. The identification results of these medicinal plants are presented in letter 166/A/LB/FMIPA/UNTAN/2024.

Data analysis

The data analysis technique applied in this study is descriptive qualitative analysis. The data obtained from informants regarding the names of medicinal plants, the parts of the plants used, and the methods of processing the medicinal plants are presented in narrative form, accompanied by images and tables that summarize the results of the interviews (Panjaitan et al. 2025).

RESULTS AND DISCUSSION

Community knowledge and practices in the treatment of hypertension

The community of Sari Makmur Village generally seeks medical examination at the nearest community health center (*puskesmas*) or hospital upon experiencing hypertension symptoms such as blurred vision, fatigue, nausea, severe headache, and vertigo. These examinations aim to measure blood pressure levels. If diagnosed with hypertension, patients are prescribed antihypertensive medication to be taken until their condition stabilizes or improves. However, when symptoms are mild and considered manageable, community members sometimes resort to using medicinal plants believed to lower blood pressure. The use of medicinal plants is favored due to the ease of obtaining the raw materials. The community appreciates traditional medicinal plants because they are perceived as effective in treating ailments and do not cause adverse side effects. Traditional medicine is defined as the knowledge, skills, and practices based on local cultural theories, beliefs, and experiences used for health maintenance (Gakuya et al. 2020). Consequently, medicinal plants constitute a vital component of healthcare due to their accessibility and relatively affordable cost for rural communities.

Medicinal plants are used to treat hypertension

The Malay community in Sari Makmur Village possesses local wisdom, including collective knowledge and experience in using plants for alternative medicine. This knowledge of medicinal plants is passed down orally from generation to generation. There are various species of plants used for treatment, including for hypertension. These plants are usually intentionally planted in home yards or gardens. Based on interviews, it was found that the plants used to treat hypertension in Sari Makmur Village consist of 12 species of plants from 11 families (Table 1, Figure 2). The most commonly used plant family is Apiaceae (Table 1). Of these 12 plant species, six are herbs: *bunga panyok* (*Catharanthus roseus*), *daun sop* (*Apium graveolens*), *kumis kucing* (*Orthosiphon aristatus*), *pegage* (*Centella asiatica*), *sambung nyawe* (*Gynura procumbens*), and *telang* (*Clitoria ternatea*). Three others are shrubs: *engkudu* (*Morinda citrifolia*), *gerinang* (*Averrhoa bilimbi*), and *mahkota dewa* (*Phaleria macrocarpa*). Additionally, two are trees: *nangka belande* (*Annona muricata*) and *salam* (*Syzygium polyanthum*), and one is a liana: *patterwali* (*Tinospora cordifolia*) (Figure 4).

The medicinal plants most frequently mentioned by informants for treating hypertension are *nangka belande* (*A. muricata*) and *salam* (*S. polyanthum*) (Table 2). The processing method most commonly employed involves boiling, followed by consumption of the decoction (Figure 3). The plant parts used as antihypertensive remedies include leaves, fruits, stems, and flowers (Figure 4). Leaves are the plant part most frequently utilized as an antihypertensive remedy, comprising nine species, followed by fruits with two species, stems with one species, and flowers with one species (Figure 4). This is consistent with the findings of Panjaitan et al. (2024a, b, c), which also demonstrated that leaves are the most commonly used plant part due to their content of various bioactive compounds such as alkaloids, flavonoids, phenols, saponins, and tannins that contribute to their medicinal properties.

Table 1. The plants used as antihypertensive by the community of Sari Makmur Village, Sambas District, West Kalimantan, Indonesia

Family	Scientific name	Local name	Part used	Processing method
Annonaceae	*Annona muricata*	*Nangka Belande*	Leaf	Five or seven leaves of *nangka belande* are washed clean, then boiled with 1 glass of water. The boiled water is consumed while warm and should be taken twice a day.
Apiaceae	*Apium graveolens*	*Daun sop*	Leaf	Five leaves of *sop* are washed clean, then boiled with 1 glass of water. The boiled water is consumed and taken twice a day.
Apiaceae	*Centella asiatica*	*Pegage*	Leaf	Three or five leaves of *pegage* are washed clean, then boiled with 1 glass of water. The boiled water is consumed and taken twice a day.
Apocynaceae	*Catharanthus roseus*	*Bunga Panyok*	Leaf	Three leaves of *bunga panyok* are washed clean, then boiled with 1 glass of water. Afterward, the boiled water is consumed and taken once a day.
Asteraceae	*Gynura procumbens*	*Sambung Nyawe*	Leaf	Three leaves of *sambung nyawe* are washed clean, then boiled with 1 glass of water. Afterward, the boiled water is consumed and taken once a day.
Fabaceae	*Clitoria ternatea*	*Telang*	Flower	There are two methods of preparation. The first method: five or seven *telang* flowers are washed clean, then boiled with 1 glass of water. Afterward, the boiled water is consumed and taken twice a day. The second method: five or seven *telang* flowers are steeped in warm water, then the water is consumed and taken twice a day.
Lamiaceae	*Orthosiphon aristatus*	*Kumis Kucing*	Leaf	Five leaves of *kumis kucing* are washed clean, then boiled with 1 glass of water. After boiling, the water is consumed and taken twice a day.
Menispermaceae	*Tinospora cordifolia*	*Patterwali*	Stem	The stem of *patterwali* is washed clean, then cut into small pieces and dried under the sun. Afterward, the dried stem of *patterwali* is boiled with 1 glass of water, and the boiled water is consumed once a day.
Myrtaceae	*Syzygium polyanthum*	*Salam*	Leaf	Three leaves of *salam* are washed clean, then boiled with 1 glass of water. Afterward, the boiled water is consumed twice a day.
Oxalidaceae	*Averrhoa bilimbi*	*Gerinang*	Leaf	Five or seven leaves of *gerinang* are washed clean, then boiled with 1 glass of water. Afterward, the boiled water is consumed twice a day
Rubiaceae	*Morinda citrifolia*	*Engkudu*	Leaf	Three leaves of *engkudu* are washed clean, then boiled with 1 glass of water. Afterward, the boiled water is consumed twice a day.
			Fruit	There are two methods of preparation. The first method: one or three *engkudu* fruits are washed clean, then blended with a little water, filtered, and the juice is consumed twice a day. The second method: one or three *engkudu* fruits are crushed, then a little water is added, filtered, and the juice is consumed twice a day. If the taste is too bitter, a little sugar can be added to sweeten it.
Thymelaeaceae	*Phaleria macrocarpa*	*Mahkota Dewa*	Fruit	The *mahkota dewa* fruit is washed clean, then cut into small pieces, with the seeds removed, and dried under the sun. Afterward, the *mahkota dewa* fruit is boiled with 1 glass of water, and the resulting decoction is consumed twice a day.

During sample collection in the field, it was observed that plants such as *bunga panyok* (*C. roseus*), *daun sop* (*A. graveolens*), *engkudu* (*M. citrifolia*), *gerinang* (*A. bilimbi*), *mahkota dewa* (*P. macrocarpa*), and *telang* (*C. ternatea*) were found in residents' home yards, while plants such as *kumis kucing* (*O. aristatus*), *nangka belande* (*A. muricata*), *patterwali* (*T. cordifolia*), *pegage* (*C. asiatica*), *salam* (*S. polyanthum*) and *sambung nyawe* (*G. procumbens*) were found in residents' gardens. All these plants have a wide distribution due to the vast land area in Sari Makmur Village, making them easy to access.

Benefits and phytochemical content in plants

The leaves of *A. muricata*, locally known as *nangka belande*, are one of the plant parts used by the people of Sari Makmur Village particularly by the Malay ethnic group, as an antihypertensive remedy. The use of *nangka belande* leaves as an antihypertensive is also practiced by the people of Babane Village, Samalantan Sub-district, Bengkayang District, West Kalimantan (Panjaitan et al. 2024a), and the Javanese community around Mount Merapi National Park, Central Java, Indonesia (Torimbanu et al. 2024). The processing of *nangka belande* leaves as an antihypertensive is done by boiling the leaves and drinking the resulting decoction. A study conducted by Siregar and Sinaga (2025) showed that the consumption of *nangka belande* leaf decoction in elderly hypertensive patients could lower high blood pressure. Pharmacologically, all parts of the *nangka belande* plant, except for the flowers, have been reported to possess various medicinal properties,

including antibacterial, anticancer, antidiabetic, antidiarrheal, antihypertensive, antiprotozoal, antiulcer, antiviral, and wound-healing properties (Mutakin et al. 2022). Additionally, another study using methanol extract of *nangka belande* leaves revealed that this extract has potential in treating hypertension (Nsor et al. 2024). The methanol extract of *nangka belande* leaves is known to contain various active compounds such as alkaloids, coumarins, flavonoids, phenols, saponins, steroids, tannins, and terpenoids, which are believed to play a role in its pharmacological effects, including lowering blood pressure (Nsor et al. 2024).

The plant known as *daun sop* (*A. graveolens*) exhibits various pharmacological activities, such as anticancer, antidiabetic, antifungal, antihypertensive effects, anti-inflammatory, antimicrobial, antioxidant, antiparasitic, and anti-ulcer. These diverse benefits stem from the active compounds found in its leaves, roots, seeds, and stems (Khairullah et al. 2021). The community in Sari Makmur Village uses the leaves of this plant for antihypertensive treatment. The use of this plant for hypertension is not only practiced in Sari Makmur Village but also by the Javanese community around the Merapi Mountain National Park in Central Java (Torimbanu et al. 2024). A study conducted by Rosa and Rivai (2021) demonstrated that a garlic solution combined with the stems and leaves of this plant is effective in lowering blood pressure. Furthermore, it has been reported that the stems and leaves of this plant also contain various bioactive compounds such as alkaloids, flavonoids, glycosides, saponins, and tannins, which are believed to contribute to its pharmacological effects (Habila et al. 2024).

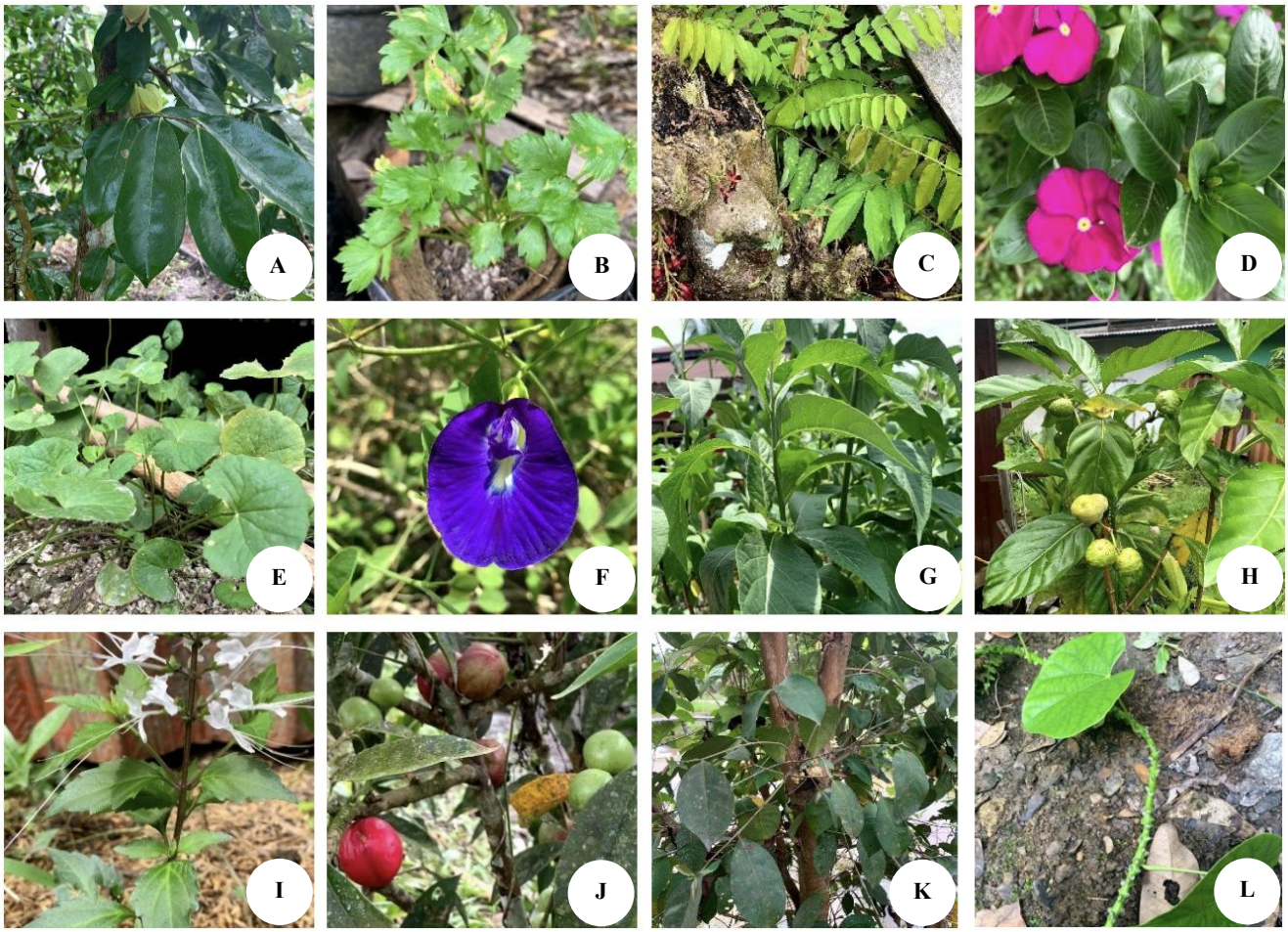

Figure 2. The species of plants utilized as antihypertensive remedies by the people of Sari Makmur Village, Sambas District, West Kalimantan, Indonesia: A. *Nangka belande* (*Annona muricata*), B. *Daun sop* (*Apium graveolens*), C. *Gerinang* (*Averrhoa bilimbi*), D. *Bunga panyok* (*Catharanthus roseus*), E. *Pegage* (*Centella asiatica*), F. *Telang* (*Clitoria ternatea*), G. *Sambung nyawe* (*Gynura procumbens*), H. *Engkudu* (*Morinda citrifolia*), I. *Kumis Kucing* (*Orthosiphon aristatus*), J. *Mahkota dewa* (*Phaleria macrocarpa*), K. *Salam* (*Syzygium polyanthum*), L. *Patterwali* (*Tinospora cordifolia*)

Figure 3. Traditional treatments for hypertension encompass various processing methods. A. Use of *nangka belande* for hypertension, B. Use of *daun sop* for hypertension, C. Use of *pegage* for hypertension, D. Use of *bunga panyok* for hypertension, E. Use of *sambung nyawe* for hypertension, F. Use of *kumis kucing* for hypertension, G. Use of *patterwali* for hypertension, H. Use of *salam* for hypertension, I. Use of *gerinang* for hypertension, J. Use of *telang* for hypertension, K and L. Use of *engkudu* for hypertension, M. Use of *mahkota dewa* for hypertension

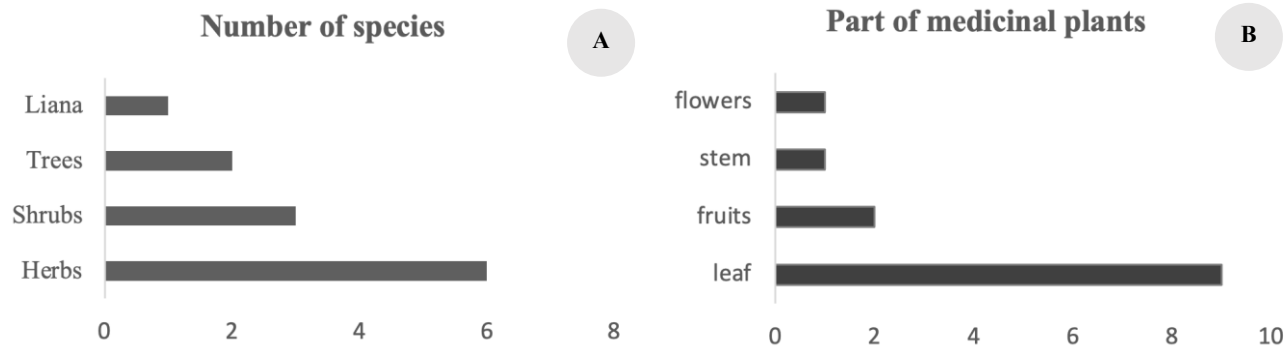

Figure 4. The number of plants categorized by habitus for each species and the corresponding plant parts or organs utilized

Table 2. List of medicinal plants for hypertension based on informant interviews

Family	Scientific name	Local name	Informant					Total
			1	2	3	4	5	
Annonaceae	*Annona muricata*	*Nangka Belande*	√	√		√		3
Apiaceae	*Apium graveolens*	*Daun sop*		√			√	2
Apiaceae	*Centella asiatica*	*Pegage*			√	√		2
Apocynaceae	*Catharanthus roseus*	*Bunga Panyok*			√	√		2
Asteraceae	*Gynura procumbens*	*Sambung Nyawe*	√		√			2
Fabaceae	*Clitoria ternatea*	*Telang*	√		√			2
Lamiaceae	*Orthosiphon aristatus*	*Kumis Kucing*				√	√	2
Menispermaceae	*Tinospora cordifolia*	*Patterwali*	√			√		2
Myrtaceae	*Syzygium polyanthum*	*Salam*	√	√	√			3
Oxalidaceae	*Averrhoa bilimbi*	*Gerinang*	√				√	2
Rubiaceae	*Morinda citrifolia*	*Engkudu*	√	√				2
Thymelaeaceae	*Phaleria macrocarpa*	*Mahkota Dewa*	√				√	2

Pegage (*C. asiatica*) is a plant known for its various health benefits. The communities surrounding the Protected Forest in Serbajadi Sub-district, East Aceh District, Aceh, Indonesia utilize the leaves of *pegage* to treat skin diseases, wounds, and headaches (Navia et al. 2022). Meanwhile, the community in Sari Makmur Village uses *pegage* leaves as an antihypertensive by boiling the leaves and drinking the resulting infusion. A study conducted by Nurrahmanto et al. (2021) indicated that the consumption of *pegage* leaf decoction in elderly hypertensive patients may help lower blood pressure. Furthermore, Bunaim et al. (2021) reported that the use of ethanol extract from *pegage* leaves has potential in the treatment of hypertension due to the presence of triterpenoid and flavonoid compounds, which possess antioxidant properties. These compounds play a role in the renin-angiotensin-aldosterone system, which regulates blood pressure.

Various parts of *bunga panyok* (*C. roseus*), such as the flowers, leaves, roots, seeds, and stems, are known to possess a range of pharmacological activities, including anthelmintic, anticancer, antidiabetic, antidiarrheal, antifungal, antihypertensive, antimalarial, antimicrobial, antioxidant, anti-ulcer, and wound-healing properties (Chaturvedi et al. 2022). The community in Sari Makmur Village uses the decoction of the plant's leaves as an antihypertensive remedy. Research indicates that the water extract from the leaves of this plant has the ability to lower high blood pressure (Benoît et al. 2020). This effect is believed to stem from its antioxidant properties, which help combat oxidative stress and assist in regulating blood pressure. Furthermore, the water extract from the plant's leaves contains various active compounds, such as alkaloids, flavonoids, polyterpenes, saponins, and tannins, which contribute to its pharmacological effects (Benoît et al. 2020).

Sambung nyawe (*G. procumbens*) is a plant commonly used in traditional medicine. The decoction of *sambung nyawe* leaves is used by the Dayak Sinangkan't community in Sanggau District, Entikong, West Kalimantan as an antidiabetic remedy (Panjaitan et al. 2024c), while the community in Sari Makmur Village uses it as an antihypertensive. A study by Daulay et al. (2024) showed that administering the decoction of *sambung nyawe* leaves to hypertensive patients may help lower high blood pressure. Furthermore, Shahlehi et al. (2020) reported that both methanol and water extracts from *sambung nyawe* leaves have hypotensive effects that contribute to blood pressure reduction. Phytochemical screening of the methanol and water extracts from *sambung nyawe* leaves revealed the presence of various active compounds such as alkaloids, anthraquinones, flavonoids, saponins, steroids, tannins, and triterpenoids (Shahlehi et al. 2020).

Telang (*C. ternatea*) is a plant known for its health benefits. The communities in three villages along the upper

reaches of the Bengawan Solo River in Central Java, Indonesia—Ngringo Village, Palur Village, and Sidodadi Village use the flowers of this plant for their antioxidant and antimicrobial properties (Triyanto et al. 2024), while the community in Sari Makmur Village uses the flowers of this plant as an antihypertensive. Research conducted by Maneesai et al. (2021) showed that the water extract of *telang* flowers contains various bioactive compounds, with flavonoids as the main component. The flavonoids present include kaempferol 3-glucoside, kaempferol 3-isorhamnoside, quercetin 3-glucoside,quercetin 3-rhamnosyl-rhamnosyl-glucoside, and rutin. Additionally, this extract also contains L-tryptophan, an amino acid. These flavonoids play a role in reducing oxidative stress and increasing the bioavailability of nitric oxide (NO), which contributes to blood pressure regulation. Furthermore, the study by Maneesai et al. (2021) also demonstrated that the water extract of this plant's flowers is effective in preventing and lowering high blood pressure.

Kumis kucing (*O. aristatus*) is a plant known for its health benefits and is commonly used in traditional medicine. Communities from various areas utilize *kumis kucing* for a range of medical purposes. For example, the Javanese and Dayak Seberuang communities in Balai Harapan Village, Tempunak Sub-district, Sintang District, West Kalimantan use decoctions of the flowers, leaves, and roots of *kumis kucing* to tighten female reproductive organs (Panjaitan et al. 2024b). Meanwhile, the community in Sari Makmur Village uses a decoction of *kumis kucing* leaves as an antihypertensive. Phytochemical screening results show that ethanol and methanol extracts from *kumis kucing* leaves contain various bioactive compounds, such as alkaloids, coumarins, flavonoids, isoprenoids, organic acids, phenolic compounds, saponins, steroids, and terpenoids (Maulana et al. 2022). The flavonoid content in *kumis kucing* leaves is known to have antihypertensive effects that contribute to lowering blood pressure (Setiawan 2024). Furthermore, a study conducted by Cita et al. (2023) demonstrated that the consumption of *kumis kucing* leaf infusions in the elderly increases urinary frequency, which indirectly helps lower high blood pressure. Additionally, *kumis kucing* leaves are also known to possess various other pharmacological activities, such as antibacterial, antidiabetic, antifungal, antigenotoxic, antihyperglycemic, anti-inflammatory properties, antioxidant, antiplasmodial, cardioactive, cytotoxic, and hepatoprotective (Abdullah et al. 2020).

The leaves of the *patterwali* plant (*T. cordifolia*) are used by the Javanese community around the Merapi Mountain National Park, Central Java to enhance immune function (Torimbanu et al. 2024), while the stems of *patterwali* are used by the community in Sari Makmur Village as an antihypertensive. A study conducted by Haque et al. (2023) showed that chloroform extract from the stems of *patterwali* has hypotensive activity, making it a potential antihypertensive agent. Phytochemical analysis also revealed that the stems of *patterwali* contain various active compounds, such as alkaloids, flavonoids, phenolics, steroids, and triterpenes. Additionally, the stems of this plant are known to possess various pharmacological activities, including analgesic, anticancer, antidiabetic, antimicrobial, antioxidant properties, antiparasitic, and immunomodulatory.

Salam leaf (*S. polyanthum*) offers health benefits and is commonly used in traditional medicine. The communities in Babane Village, Samalantan Sub-district, Bengkayang District, West Kalimantan (Panjaitan et al. 2024a), and Sari Makmur Village use a decoction of *salam* leaves as an antihypertensive remedy. A study by Alfaini et al. (2023) showed that administering *salam* leaf decoction to the elderly can help lower high blood pressure. Additionally, research by Ismail et al. (2018) revealed that methanol extract of *salam* leaves has the potential to reduce high blood pressure. Furthermore, ethanol extract of *salam* leaves is known to contain various phytochemical compounds such as alkaloids, flavonoids, saponins, steroids, and tannins, which contribute to its pharmacological effects (Hartanti et al. 2019).

The community in Sari Makmur Village uses a decoction of *gerinang* leaves (*A. bilimbi*) to help lower high blood pressure. A study conducted by Amri (2022) showed that the consumption of *gerinang* leaf decoction in hypertensive patients can reduce blood pressure. Ethanol extract of *gerinang* leaves is known to contain various active compounds, such as alkaloids, flavonoids, glycosides, saponins, tannins, and terpenoids (Novitri et al. 2020). Furthermore, research by Novitri et al. (2020) on ethanol extract of *gerinang* leaves also revealed that this plant possesses antihypertensive activity that has the potential to lower blood pressure.

Engkudu (*M. citrifolia*) is a plant known for its ability to lower high blood pressure. A study conducted by Wigati et al. (2017) reported that ethanol extracts from the fruit and leaves of *engkudu* contain active compounds such as flavonoids and scopoletin, which play a role in the mechanism of blood pressure reduction. The study also showed that extracts of both the leaves and fruit of *engkudu* significantly reduce blood pressure. In traditional medicine, the community in Sari Makmur Village uses the fruit and leaves of *engkudu* as an antihypertensive, while the community in Babane Village, Samalantan Sub-district, Bengkayang District, West Kalimantan uses the leaves of *engkudu* for the same purpose (Panjaitan et al. 2024a).

Mahkota dewa (*P. macrocarpa*) is a plant known for its health benefits. The Javanese community around the Merapi Mountain National Park, Central Java uses the fruit of *mahkota dewa* to enhance immune function (Torimbanu et al. 2024). Meanwhile, the communities in Babane Village, Samalantan Sub-district, Bengkayang District, West Kalimantan (Panjaitan et al. 2024a), and Sari Makmur Village use it as an antihypertensive. A study conducted by Rizal et al. (2020) examined the effects of consuming ethnic foods containing various parts of *mahkota dewa*, such as the fruit and leaves. The results of this study indicated that consuming foods made from the fruit, leaves, or a combination of both can contribute to lowering blood pressure. Additionally, methanol extract of *mahkota dewa* is known to contain various active compounds such as flavonoids, glycosides, saponins,

tannins, and terpenes, which contribute to its pharmacological activities (Sakti et al. 2020).

Of the 12 utilized plants, conservation efforts are necessary to ensure their continued existence. Although these plants are currently still easy to find and commonly encountered, conservation measures remain important. One conservation strategy is planting these plants in home yards or garden plots. This study also has limitations, as during data collection the researcher did not directly observe the informants' performing treatments, but only gathered information about the plants used and the methods of processing them as antihypertensive medicines.

As a conclusion, various plants such as *bunga panyok* (*C. roseus*), *daun sop* (*A. graveolens*), *engkudu* (*M. citrifolia*), *gerinang* (*A. bilimbi*), *kumis kucing* (*O. aristatus*), *mahkota dewa* (*P. macrocarpa*), *nangka belande* (*A. muricata*), *patterwali* (*Tinospora cordifolia*), *pegage* (*C. asiatica*), *salam* (*S. polyanthum*), *sambung nyawe* (*G. procumbens*), and *telang* (*C. ternatea*) are known to be utilized for treating hypertension or lowering blood pressure. Among the various plant types, the most commonly used family is Apiaceae, with the leaves being the most frequently utilized plant part, and boiling being the predominant processing method. These findings highlight the importance of preserving local knowledge as an alternative resource in the development of herbal medicine. Furthermore, this research can serve as a foundation for developing community health strategies based on local resources, especially in rural areas with limited access to medical facilities. These plants also have the potential to be further investigated through phytochemical studies to identify the active compounds responsible for their antihypertensive effects, thereby opening opportunities for the development of scientifically based herbal medicines.

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