



AN ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS ADMINISTERED FOR THE TREATMENT OF HYPERTENSION IN THE SAGALAHERANG REGION, SUBANG, WEST JAVA, INDONESIA

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ABSTRACT

Hypertension is one of the serious medical conditions that dramatically increases the chances of various related health problems. Currently, researchers are starting to look for new antihypertensive compound candidates derived from natural ingredients that have been empirically proven to have antihypertensive effects. This research aims to document and preserve the use of ethnomedicinal to treat hypertension by communities in the Sagalaherang Region, Subang, West Java, Indonesia. Fieldwork was carried out from March to April 2024 using direct interviews, questionnaires, and discussions. Plant species are identified based on standard taxonomic methods, flower morphological characteristics, and where possible, using samples for comparison, as well as consultation with experts and the literature. The plant types obtained were grouped into families according to the Cronquist classification system. Plant names were checked against the Plant List (www.plantlist.org) and the International Plant Name Index (www.ipni.org). This research reports that 30 plant species are commonly used by people in the Sagalaherang Region to treat hypertension. Among the various plant parts used, leaves (50.0%) are most frequently used in making medicines, followed by rhizomes (13.3%), fruit (13.3%), flowers, stem, and seed (respectively 6.7%) and rind (3.3%). Meanwhile, the most frequently used preparation methods were decoction (76.7%) and infusion (23.3%). The results of this research confirm that people in the Sagalaherang Region still rely heavily on medicinal plants for their health care system, especially for the treatment of hypertension with the most frequently used parts of the leaves and their use in decoctions and infusions.

KEYWORDS: Traditional medicine, Ethnomedicinal plants, Sagalaherang Region, Hypertension.

INTRODUCTION

Hypertension (HT) is a cardiovascular disease whose complications (hypertrophic cardiomyopathy, hypertensive encephalopathy, malignant retinopathy, malignant nephroangiosclerosis, arteriosclerosis, etc.) are the main cause of death worldwide. The global prevalence of hypertension in the adult global population was estimated in 2014 at 30%.^[1] Epidemiological data shows that this proportion is expected to reach 68% or 125.5 million people by 2025.^[2] The growth in prevalence in developing countries is most likely related to changes in nutritional habits, sedentary lifestyles, or alcohol use.^[3] Treatment of hypertension has several axes including medications and lifestyle improvements. Antihypertensive treatment that may be associated with dietary and lifestyle measures significantly reduces arterial pressure and consequently reduces cardiovascular

morbidity and mortality.^[4] These drugs have several limitations, namely, side effects, cost, and inaccessibility in some locations in developing countries. The search for new drugs, especially from natural products and medicinal plants, is of great interest for the development of more efficient and better-tolerated drugs.^[5]

Medicinal plants have been widely used in traditional practices by different ethnic populations throughout the world for the prevention and/or treatment of several chronic diseases. Despite the development of newer technologies and advances in modern medicine, most of the world's population still relies on traditional systems of medicine to fulfill their medical care, especially in Indonesia.^[6] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially to treat hypertension, is the Sagalaherang Region. This

research aims to obtain detailed information about the use of herbal plants for alternative therapy for hypertension in Sagalaherang Region, Subang, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Sagalaherang is located in Subang Regency, West Java, Indonesia, with an area of 50.45 km². This area has an altitude of 1000 meters above sea level with an average maximum air temperature of 22°C and a minimum of 17°C. Moreover, it is located between 06°37' 39" South Latitude and 107°37' 45" East Longitude. This area is a tropical climate area that is mostly inhabited by Sundanese tribes (98%) and other tribes (2%). Vegetation in the study area is in humid conditions with an average rainfall of 279 mm/year.

Data Collection

An extensive field survey was carried out to obtain information about medicinal plants from the Sundanese tribe in the study area. To document existing information about medicinal plants from tribal practitioners, several field visits were conducted from March to April 2024 in the Sagalaherang Region, Subang, West Java, Indonesia. During the research, ethnomedicinal information was collected from middle-aged and older tribal practitioners in their local language (Sundanese), through direct interviews, questionnaires, and discussions. Information on local names of plants, plant parts used, preparation methods and administration routes (e.g., infusion, paste, juice and decoction) of all ethnomedicinal plants collected were recorded during the survey period.

Botanical Identification

Plant species are identified based on standard taxonomic methods, flower morphological characteristics, and where possible, using samples for comparison, as well as consultation with experts and the literature.^[7] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.^[8] Plant names were checked against the Plant List (www.plantlist.org) and the International Plant Name Index (www.ipni.org).

Ethics Statement

All participants provided verbal consent before the interview and gave consent to publish the information they provided.

RESULTS AND DISCUSSION

This research revealed that 30 plant species are commonly used by local people to treat hypertension (Table 1). This shows that the study location is affordable in terms of biodiversity. Among the various plant parts used, leaves (50.0%) are most frequently used in making medicines, followed by rhizomes (13.3%), fruit (13.3%), flowers, stem, and seed (respectively 6.7%), and rind (3.3%). The use of leaves is reported to be easier to prepare and easier to extract active substances from them for treatment. At the same time, leaves have less effect on the mother plant.^[9] Meanwhile, the most frequently used preparation methods were decoction (76.7%) and infusion (23.3%). These results are in line with previous research which reported that the forms of traditional medicine most widely used by the community were decoctions and infusions.^[7]

Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Sagalaherang, Subang, West Java, Indonesia.

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	<i>Allium sativum</i> L.	Alliaceae	Bawang Putih	Rhizome	Infusion	15 grams once a day
2	<i>Aloe vera</i> Burm.f.	Asphodelaceae	Lidah Buaya	Stem	Decoction	20 grams once a day
3	<i>Andrographis paniculata</i> Nees.	Acanthaceae	Sambiloto	Leaf	Decoction	25 grams once a day
4	<i>Annona muricata</i> L.	Annonaceae	Sirsak	Leaf	Infusion	100 grams once a day
5	<i>Anredera cordifolia</i> (Ten.) Steenis.	Basellaceae	Binahong	Leaf	Decoction	30 grams once a day
6	<i>Artocarpus communis</i> Forst.	Moraceae	Sukun	Leaf	Decoction	70 grams once a day
7	<i>Averrhoa carambola</i> L.	Oxalidaceae	Belimbing	Leaf	Infusion	50 grams once a day
8	<i>Carica papaya</i> L.	Caricaceae	Pepaya	Leaf	Decoction	300 grams once a day
9	<i>Cinnamomum verum</i> J.Presl.	Lauraceae	Kayu Manis	Stem	Decoction	10 grams once a day
10	<i>Citrus aurantifolia</i> (Christm) Swingle	Rutaceae	Jeruk Nipis	Fruit	Decoction	50 grams once a day
11	<i>Clitoria ternatea</i> L.	Fabaceae	Bunga Telang	Flower	Decoction	10 grams once a day
12	<i>Curcuma longa</i> L.	Zingiberaceae	Kunyit	Rhizome	Infusion	150 grams once a day
13	<i>Garcinia mangostana</i> L.	Clusiaceae	Manggis	Rind	Infusion	50 grams once a day
14	<i>Hibiscus sabdariffa</i> L.	Malvaceae	Rosela	Flower	Decoction	10 grams once a day
15	<i>Kaempferia galanga</i> L.	Zingiberaceae	Kencur	Rhizome	Infusion	25 grams once a day
16	<i>Mangifera indica</i> L.	Anacardiaceae	Mangga	Leaf	Decoction	20 grams once a day
17	<i>Momordica charantia</i> L.	Cucurbitaceae	Pare	Leaf	Decoction	100 grams once a day
18	<i>Morinda citrifolia</i> L.	Rubiaceae	Mengkudu	Fruit	Infusion	10 grams once a day
19	<i>Moringa oleifera</i> Lamk.	Moringaceae	Kelor	Leaf	Decoction	100 grams once a day
20	<i>Nigella sativa</i> L.	Ranunculaceae	Jinten Hitam	Seed	Decoction	100 grams once a day

21	<i>Ocimum sanctum</i> Linn.	Lamiaceae	Surawung	Leaf	Decoction	2 grams once a day
22	<i>Orthosiphon aristatus</i> (Blume) Miq.	Lamiaceae	Kumis Kucing	Leaf	Decoction	50 grams once a day
23	<i>Persea Americana</i> Mill.	Lauraceae	Alpukat	Seed	Decoction	10 grams once a day
24	<i>Phaleria macrocarpa</i> (Scheff.) Boerl.	Thymelaceae	Mahkota Dewa	Fruit	Decoction	200 grams once a day
25	<i>Piper betle</i> L.	Piperaceae	Sirih	Leaf	Decoction	500 grams once a day
26	<i>Psidium guajava</i> L.	Myrtaceae	Jambu Biji	Leaf	Decoction	50 grams once a day
27	<i>Solanum torvum</i> Sw.	Solanaceae	Tokakak	Fruit	Decoction	70 grams once a day
28	<i>Syzygium polyanthum</i> (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	80 grams once a day
29	<i>Tinospora crispa</i> L.	Menispermaceae	Baratawali	Leaf	Decoction	80 grams once a day
30	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	5 grams once a day

CONCLUSIONS

The results of this research confirm that people in the Sagalaherang Region still rely heavily on medicinal plants for their health care system, especially for the treatment of hypertension with the most frequently used parts of the leaves and their use in decoctions and infusions.

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