



ETHNOPHARMACOLOGICAL STUDY OF ANTIHYPERLIPIDEMIC IN THE LEUWIDAMAR REGION, LEBAK, BANTEN, INDONESIA

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ABSTRACT

Hyperlipidemia is basically a risk factor for causing heart related diseases, strokes, high blood pressure, diabetes, renal disorders, etc. This research aims to document and preserve the use of ethnomedicinal to treat hyperlipidemia by communities in the Leuwidamar, Lebak, Banten, Indonesia. Fieldwork was carried out from October to December 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 Leuwidamar Region to treat hyperlipidemia. 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 Leuwidamar Region still rely heavily on medicinal plants for their health care system, especially for the treatment of hyperlipidemia with the most frequently used parts of the leaves and their use in decoctions and infusions.

KEYWORDS: Traditional medicine, Ethnomedicinal plants, Leuwidamar Region, Antihyperlipidemic.

INTRODUCTION

Hyperlipidemia is a chronic propulsive complication resulting from the aberrant metabolism of carbohydrates, proteins, and fats. It nestles as elevated levels of fat molecules such as total cholesterol (TC), triglyceride (TG), low-density lipoprotein (LDL), and very low-density lipoprotein (VLDL) in the circulatory system.^[1] The fundamental cause of hyperlipidemia is lopsided energy existing in the bloodstream between calories consumed and calories expenditure which is bolstered by a sedentary lifestyle.^[2] Alongside, the augmented blood cholesterol can be manifested due to genetic reasons.^[3] The progressed hyperlipidemic condition is intertwined with several severe maladies in the body such as cardiovascular disease (CD),^[4] diabetes mellitus type 2 (T2DM),^[5] non-alcoholic fatty liver disease,^[6] kidney disease, reproductive disease as well as osteoarthritis.^[7] In 2019 approximately 17.9 million people died from CD, representing 32% of all global deaths in which 85% had succumbed because of heart attack and stroke. In the

impending days, experts are conjecturing that the prevalence of CD will be prodigious due to sedentary lifestyle during the covid-19 pandemic and infectious nature of coronavirus.^[8] Cardiovascular diseases such as heart failure (FR), peripheral arterial disease (PAD), and coronary heart disease (CHD) evolve because of deposit fatty tissue (Plaques) inside the blood vessel called atherosclerosis.^[9] As a result, the blood flow is averted to reach several organs such as the heart, brain, and extremities that belong to heart attack, stroke, and peripheral arterial disease.^[10] Currently available hypolipidemic drugs have been reported to have several worrying side effects including hyperuricemia, muscle damage, impotence, memory loss, peripheral neuropathy, body aches, gynecomastia, skin rashes, and others. In addition, there is also an increased risk of myopathy and rhabdomyolysis which commonly occurs when used in combination with other drugs.^[11] Most hypolipidemic drugs can be effective if used for several weeks but may result in worsening side effects such as liver damage.^[12]

Therefore, it is necessary to search for new antihyperlipidemic agents derived from natural ingredients in the form of medicinal plants. 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.^[13] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially to treat hyperlipidemia, is the Leuwidamar Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for hyperlipidemia in Leuwidamar Region, Lebak, Banten, Indonesia using a field survey method.

MATERIALS AND METHODS

Study area

Leuwidamar is located in Lebak Regency, Banten, Indonesia, with an area of 176.61 km². This area has an altitude of 600 meters above sea level with an average maximum air temperature of 32°C and a minimum of 20°C. Moreover, it is located between 06°34'34" South Latitude and 106°13'37" East Longitude. This area is a tropical climate area that is mostly inhabited by Sundanese tribes (80%) and other tribes (20%). Vegetation in the study area is in humid conditions with an average rainfall of 4,000 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 October to December 2024 in the Leuwidamar Region, Lebak, Banten, 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.^[14] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.^[15] 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 hyperlipidemia (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.^[16] 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.^[14]

Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Leuwidamar, Lebak, Banten, 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	150 grams once a day
2	<i>Aloe vera</i> Burm. f.,	Asphodelaceae	Lidah Buaya	Stem	Decoction	250 grams once a day
3	<i>Andrographis paniculata</i> Nees	Acanthaceae	Sambiloto	Leaf	Decoction	50 grams once a day
4	<i>Annona muricata</i> L.	Annonaceae	Sirsak	Leaf	Infusion	250 grams once a day
5	<i>Anredera cordifolia</i> (Ten.) Steenis	Basellaceae	Binahong	Leaf	Decoction	10 grams once a day
6	<i>Averrhoa carambola</i> L.	Oxalidaceae	Belimbing	Leaf	Infusion	50 grams once a day
7	<i>Carica papaya</i> L.	Caricaceae	Pepaya	Leaf	Decoction	150 grams once a day

8	<i>Cinnamomum verum</i> J. Presl	Lauraceae	Kayu Manis	Stem	Decoction	100 grams once a day
9	<i>Citrus aurantifolia</i> (Christm) Swingle	Rutaceae	Jeruk Nipis	Fruit	Decoction	5 grams once a day
10	<i>Clitoria ternatea</i> L.	Fabaceae	Bunga Telang	Flower	Decoction	10 grams once a day
11	<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	Asteraceae	Sintrong	Leaf	Decoction	100 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	200 grams once a day
14	<i>Hibiscus sabdariffa</i> L.	Malvaceae	Rosela	Flower	Decoction	50 grams once a day
15	<i>Kaempferia galanga</i> L.	Zingiberaceae	Kencur	Rhizome	Infusion	200 grams once a day
16	<i>Mangifera indica</i> L.	Anacardiaceae	Mangga	Leaf	Decoction	150 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	50 grams once a day
20	<i>Nigella sativa</i> L.	Ranunculaceae	Jinten Hitam	Seed	Decoction	200 grams once a day
21	<i>Pandanus amaryllifolius</i> Roxb.	Pandanaceae	Pandan Wangi	Leaf	Decoction	10 grams once a day
22	<i>Persea americana</i> Mill.	Lauraceae	Alpukat	Seed	Decoction	150 grams once a day
23	<i>Phaleria macrocarpa</i> (Scheff.) Boerl)	Thymelaceae	Mahkota Dewa	Fruit	Decoction	200 grams once a day
24	<i>Phyllanthus niruri</i> L.	Phyllanthaceae	Meniran	Leaf	Decoction	50 grams once a day
25	<i>Piper betle</i> L.	Piperaceae	Sirih	Leaf	Decoction	50 grams once a day
26	<i>Psidium guajava</i> L.	Myrtaceae	Jambu Biji	Leaf	Decoction	20 grams once a day
27	<i>Solanum torvum</i> Sw.	Solanaceae	Tokakak	Fruit	Decoction	10 grams once a day
28	<i>Syzygium polyanthum</i> (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	10 grams once a day
29	<i>Tinospora crispa</i> L.	Menispermaceae	Baratawali	Leaf	Decoction	20 grams once a day
30	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	100 grams once a day

CONCLUSIONS

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

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