



ETHNOPHARMACOLOGICAL STUDY OF ANTIHYPERLIPIDEMIC IN THE KERTASARI REGION, BANDUNG, WEST JAVA, INDONESIA

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ABSTRACT

Hyperlipidemia is a secondary metabolic dysregulation associated with increased levels of triglycerides, cholesterol, and LDL in serum which is a major risk factor for early cardiovascular diseases such as atherosclerosis, hypertension, coronary heart disease, and others. Currently, researchers are starting to look for new antihyperlipidemic compound candidates derived from natural ingredients that have been empirically proven to have antihyperlipidemic effects. This research aims to document and preserve the use of ethnomedicinal to treat hyperlipidemia by communities in the Kertasari Region, Bandung, West Java, 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 Kertasari Region to treat hyperlipidemia. Among the various plant parts used, leaves (53.3%) are most often used in making medicine, followed by rhizome (23.3%), stem (10.0%), seeds (6.7%), rind and fruit (3.3% respectively). Meanwhile, the most frequently used preparation methods was decoction (76.7%) and infusion (23.3%). The results of this research confirm that people in the Kertasari 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, Kertasari Region, Antihyperlipidemic.

INTRODUCTION

Hyperlipidemia is a predictor of coronary artery disease (CAD). The prevalence of this disease is quite high and increasing in both developed and developing countries in the world.^[1] Hyperlipidemia is an important risk factor in the initiation and development of atherosclerosis. The main manifestations of this disorder include increased plasma concentrations of total cholesterol (TC), triglycerides (TG), low-density lipoprotein cholesterol (LDL-C), and low concentrations of high-density lipoprotein cholesterol (HDL-C).^[2] Therefore, the main consideration in the therapy of hyperlipidemia and arteriosclerosis is to reduce the increase in serum/plasma blood lipid levels.^[3] Currently available hypolipidemic drugs have been reported to have a number of 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 usually occurs when used in combination with other drugs.^[4] Most hypolipidemic drugs can be effective if used for several weeks, but the consequences can worsen side effects such as liver damage.^[5] Therefore, it is necessary to find new antihyperlipidemic agents derived from natural ingredients in the form of herbal plants. Compared to conventional drugs, herbal plants provide many advantages, including cost-effectiveness, broad cultural acceptance, ease of accessibility, and lower side effects.^[6]

Indonesia is the second largest country in the world with forest biodiversity, where there are 28,000 plant species and 2,500 species of medicinal plants.^[7,8] Currently, research to obtain new antidyslipidemic drugs derived

from natural ingredients continues to be carried out, one of which is through exploration of active compounds from natural ingredients, especially medicinal plants that have traditionally been used by people to treat hyperlipidemia in various regions in Indonesia.^[9-11] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially to treat hyperlipidemia is Kertasari Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for hyperlipidemia in Kertasari Region, Bandung, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Kertasari is located in Bandung Regency, West Java, Indonesia, with an area of 152.07 km². This area has an altitude of 1,512 meters above sea level with an average maximum air temperature of 30°C and a minimum of 16°C. Moreover, it is located between 07°12'33" South Latitude and 107°39'28" East Longitude. This region is a tropical climate area that is mostly inhabited by Sundanese tribes (95%) and other tribes (5%). 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 Kertasari Region, Bandung, 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.^[12] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.^[13] 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 there are 30 plant species commonly used by the local Sundanese tribe to treat hyperlipidemia (Table 1). This shows that the study location is affordable in terms of biodiversity. Among the various plant parts used, leaves (53.3%) are most often used in making medicine, followed by rhizome (23.3%), stem (10.0%), seeds (6.7%), rind and fruit (3.3% respectively). 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.^[14] Meanwhile, the most frequently used preparation method was 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.^[12]

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

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	<i>Abrus precatorius</i> L.	Fabaceae	Saga	Leaf	Decoction	50 grams once a day
2	<i>Allium cepa</i> L.	Amaryllidaceae	Bawang Bombai	Rhizome	Decoction	15 grams once a day
3	<i>Allium sativum</i> L.	Alliaceae	Bawang Putih	Rhizome	Infusion	50 grams once a day
4	<i>Aloe vera</i> Burm.f.,	Asphodelaceae	Lidah Buaya	Stem	Decoction	25 grams once a day
5	<i>Alpinia galanga</i> L.	Zingiberaceae	Lengkuas	Rhizome	Decoction	15 grams once a day
6	<i>Andrographis paniculata</i> Nees	Acanthaceae	Sambiloto	Leaf	Decoction	50 grams once a day
7	<i>Annona muricata</i> L.	<u>Annonaceae</u>	Sirsak	Leaf	Infusion	50 grams once a day
8	<i>Carica papaya</i> L.	<u>Caricaceae</u>	Pepaya	Leaf	Decoction	100 grams once a day
9	<i>Ceiba pentandra</i>	Malvaceae	Kapuk	Leaf	Decoction	50 grams once

	(L.) Gaertn.					a day
10	<i>Cinnamomum verum</i> J. Presl.	Lauraceae	Kayu Manis	Stem	Decoction	25 grams once a day
11	<i>Cordia dikotoma</i> G. Forst.	Boraginaceae	Kendal	Stem	Decoction	50 grams once a day
12	<i>Curcuma longa</i> L.	<u>Zingiberaceae</u>	Kunyit	Rhizome	Infusion	20 grams once a day
13	<i>Curcuma xanthorrhiza</i> Roxb	Zingiberaceae	Temulawak	Rhizome	Decoction	100 grams once a day
14	<i>Garcinia mangostana</i> L.	Clusiaceae	Manggis	Rind	Infusion	50 grams once a day
15	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Jarak	Leaf	Decoction	150 grams once a day
16	<i>Kaempferia galanga</i> L.	Zingiberaceae	Kencur	Rhizome	Infusion	200 grams once a day
17	<i>Manilkara zapota</i> (L.) P. Royen	Sapotaceae	Sawo	Leaf	Decoction	5 grams once a day
18	<i>Momordica charantia</i> L.	Cucurbitaceae	Pare	Leaf	Decoction	100 grams once a day
19	<i>Morinda citrifolia</i> L.	Rubiaceae	Mengkudu	Fruit	Infusion	50 grams once a day
20	<i>Moringa oleifera</i> Lamk.	<u>Moringaceae</u>	Kelor	Leaf	Decoction	10 grams once a day
21	<i>Myristica fragrans</i> Houtt.	Myristicaceae	Pala	Seed	Decoction	35 grams once a day
22	<i>Nigella sativa</i> L.	Ranunculaceae	Jinten Hitam	Seed	Decoction	50 grams once a day
23	<i>Paederia foetida</i> L.	Rubiaceae	Daun Kentut	Leaf	Decoction	5 grams once a day
24	<i>Pandanus amaryllifolius</i> Roxb.	<u>Pandanaceae</u>	Pandan	Leaf	Infusion	10 grams once a day
25	<i>Persea americana</i> Mill.	Lauraceae	Alpukat	Leaf	Decoction	50 grams once a day
26	<i>Piper betle</i> L.	Piperaceae	Sirih	Leaf	Decoction	10 grams once a day
27	<i>Sauropus androgynous</i> Merr.	Phyllanthaceae	Katuk	Leaf	Decoction	15 grams once a day
28	<i>Sida rhombifolia</i> L.	Malvaceae	Sidaguri	Leaf	Decoction	5 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	20 grams once a day

CONCLUSIONS

The results of this research confirm that people in the Kertasari 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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