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ETHNOPHARMACOLOGICAL STUDY OF ANTIHYPERLIPIDEMIC IN THE DARANGDAN REGION, PURWAKARTA, WEST JAVA, INDONESIA

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ABSTRACT

Cardiovascular disease is the global leading cause of death and hyperlipidemia is implicated as one of its top contributors. This research aims to document and preserve the use of ethnomedicine to treat hyperlipidemia by people in the Darangdan Region, Purwakarta, West Java, Indonesia. Fieldwork was carried out from April to May 2026 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 study reports that 30 plant species are commonly used by people in the Darangdan Region to treat hyperlipidemia. Among the various plant parts used, leaves (50.0%) are most often used in making medicine, followed by rhizome (13.3%), fruit (13.3%), stem, seeds, and flower (6.7% respectively), and rind (3.3%). Meanwhile, the most frequently used preparation method was decoction (76.7%) and infusion (23.3%). The research results confirm that the Sundanese people in the Darangdan Region still rely heavily on medicinal plants for the treatment of hyperlipidemia. However, efforts to preserve medicinal plants and the local wisdom of the people in this area have not been significant. Therefore, it is recommended that local indigenous communities and the government carry out *in situ* and *ex situ* conservation strategies for medicinal plants in the Darangdan Region, so that the availability of medicinal plants in the region is maintained.

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

INTRODUCTION

Hyperlipidemia is a chronic genetic or acquired condition characterized by chronic elevation in the lipid levels in the blood. The prevalence of hyperlipidemia is common in patients with coronary artery disease (CAD) and other diseases.[1] The results of some studies show that over 50% of adults have higher low-density lipoprotein (LDL) levels and out of them only 35% can manage the elevated levels which indicate that the disease is untreated. In countries with low obesity rates and consumption of less fatty food, the prevalence of elevated LDL and very low-density lipoproteins (VLDL), which is indicative of hyperlipidemia and CAD, is relatively lower compared to developed countries like America and Europe.[2] Thus, in patients with hyperlipidemia, it is a polygenic phenomenon that is influenced and triggered by the intake of saturated fatty acids and dietary cholesterol, leading to obesity.[3] In order to lower the risk of cardiovascular disease (CVD) and hyperlipidemia, treatments targeting the elevated LDL were proven to be effective, but there is no clinical evidence of this treatment benefiting the hypertriglyceridemia and lowering high-density lipoproteins (HDL).[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 antihyperlipedemic 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] 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.[7-9] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially to treat hyperlipidemia is Darangdan Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for hyperlipidemia in Darangdan Region, Purwakarta, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Darangdan is located in Purwakarta Regency, West Java, Indonesia, with an area of 67.39 km^2. This area has an altitude of 500 meters above sea level with an average maximum air temperature of 35°C and a minimum of 23°C (humidity: approximately 47%). Moreover, it is located between 06°41′12″ South Latitude and 107°26′10″ East Longitude. This region 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 3,000 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 April to May 2026 in the Darangdan Region, Purwakarta, 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.[10] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.[11] 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

Hyperlipidemia is characterized by elevated levels of circulating lipids, particularly total cholesterol, low-density lipoprotein cholesterol (LDL-C), and triglycerides, and may be accompanied by reduced high-density lipoprotein cholesterol (HDL-C). Persistent dyslipidemia is an important risk factor for atherosclerosis and cardiovascular disease. Consequently, medicinal plants containing bioactive compounds with potential lipid-lowering, antioxidant, or anti-inflammatory properties are of interest in the search for complementary approaches to lipid management. Nevertheless, the traditional use of a plant does not necessarily establish its effectiveness in reducing blood lipid concentrations.[12] 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 (50.0%) are most often used in making medicine, followed by rhizome (13.3%), fruit (13.3%), stem, seeds, and flower (6.7% respectively), and rind (3.3%). Meanwhile, the most frequently used preparation method was decoction (76.7%) and infusion (23.3%). The findings indicate that decoction was the predominant preparation method, while infusion was used for selected species. These methods are important components of traditional medicine because they influence the quantity and type of constituents extracted from plant material. Decoction typically involves heating plant material in water for a period of time. It may facilitate the extraction of certain water-soluble constituents, particularly from relatively firm plant materials. Infusion generally involves steeping plant material in hot or warm water, depending on the traditional preparation procedure. Its extraction characteristics may differ from those of decoction.[13]

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

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	*Allium sativum* L.	Alliaceae	Bawang Putih	Rhizome	Infusion	10 grams once a day
2	*Aloe vera* Burm.f.,	Asphodelaceae	Lidah Buaya	Stem	Decoction	150 grams once a day
3	*Andrographis paniculata* Nees	Acanthaceae	Sambiloto	Leaf	Decoction	80 grams once a day
4	*Annona muricata* L.	Annonaceae	Sirsak	Leaf	Infusion	100 grams once a day
5	*Anredera cordifolia* (Ten.) Steenis	Basellaceae	Binahong	Leaf	Decoction	10 grams once a day
6	*Averrhoa carambola* L.	Oxalidaceae	Belimbing	Leaf	Infusion	10 grams once a day
7	*Carica papaya* L.	Caricaceae	Pepaya	Leaf	Decoction	200 grams once a day
8	*Cinnamomum verum* J.Presl	Lauraceae	Kayu Manis	Stem	Decoction	100 grams once a day
9	*Citrus aurantifolia* (Christm) Swingle	Rutaceae	Jeruk Nipis	Fruit	Decoction	50 grams once a day
10	*Clitoria ternatea* L.	Fabaceae	Bunga Telang	Flower	Decoction	10 grams once a day
11	*Cosmos caudatus* Kunth	Asteraceae	Kenikir	Leaf	Decoction	10 grams once a day
12	*Curcuma longa* L.	Zingiberaceae	Kunyit	Rhizome	Infusion	100 grams once a day
13	*Garcinia mangostana* L.	Clusiaceae	Manggis	Rind	Infusion	200 grams once a day
14	*Hibiscus sabdariffa* L.	Malvaceae	Rosela	Flower	Decoction	50 grams once a day
15	*Kaempferia galanga* L.	Zingiberaceae	Kencur	Rhizome	Infusion	100 grams once a day
16	*Mangifera indica* L.	Anacardiaceae	Mangga	Leaf	Decoction	100 grams once a day
17	*Momordica charantia* L.	Cucurbitaceae	Pare	Leaf	Decoction	150 grams once a day
18	*Morinda citrifolia* L.	Rubiaceae	Mengkudu	Fruit	Infusion	50 grams once a day
19	*Moringa oleifera* Lamk.	Moringaceae	Kelor	Leaf	Decoction	100 grams once a day
20	*Nigella sativa* L.	Ranunculaceae	Jinten Hitam	Seed	Decoction	100 grams once a day
21	*Ocimum tenuiflorum* L.	Lamiaceae	Kemangi	Leaf	Decoction	80 grams once a day
22	*Persea americana* Mill.	Lauraceae	Alpukat	Seed	Decoction	10 grams once a day
23	*Phaleria macrocarpa* (Scheff.) Boerl)	Thymelaceae	Mahkota Dewa	Fruit	Decoction	10 grams once a day
24	*Physalis angulate* L.	Solanaceae	Ceplukan	Leaf	Decoction	100 grams once a day
25	*Piper betle* L.	Piperaceae	Sirih	Leaf	Decoction	10 grams once a day
26	*Psidium guajava* L.	Myrtaceae	Jambu Biji	Leaf	Decoction	100 grams once a day
27	*Solanum torvum* Sw.	Solanaceae	Tokakak	Fruit	Decoction	50 grams once a day
28	*Syzygium polyanthum* (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	100 grams once a day
29	*Tinospora crispa* L.	Menispermaceae	Baratawali	Leaf	Decoction	150 grams once a day
30	*Zingiber officinale* Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	100 grams once a day

CONCLUSIONS

In conclusion, this study highlights the diversity of traditional medicinal plants that may contribute to the discovery of potential antihyperlipidemic agents. The findings document traditional plant use, plant parts, preparation methods, and reported dosages, but do not independently demonstrate lipid-lowering efficacy. Further phytochemical, pharmacological, toxicological, and clinical investigations are necessary to determine which plants have reproducible antihyperlipidemic effects and whether their traditional preparations can be developed into safe and effective therapeutic options.

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