



**ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS WITH
ANTIHYPERLIPIDEMIC EFFECTS IN THE CARIU, BOGOR, WEST JAVA,
INDONESIA**

Bunga Citra Lestari, Aprizal Maulana, Deani, Elvia Zada Nabilah Kusumastuti, Nayla Putri Hermawan, Rabiha Nur Shadrina, Rhevi Dwi Rahayu, Sabitha Salsabilla Mahabab, Saskia Azahra, Septia Rahmadani, Siti Fatimah, Teguh Naufal Firmansyah, Wiwi Nurhalimah Putri, Zahra Nur Fadillah, Zahwa Oktaveriska Rivani, Maulana Yusuf Alkandahri*

Faculty of Pharmacy, Universitas Buana Perjuangan Karawang, Karawang, West Java, Indonesia.



*Corresponding Author: Maulana Yusuf Alkandahri

Faculty of Pharmacy, Universitas Buana Perjuangan Karawang, Karawang, West Java, Indonesia.

DOI: <https://doi.org/10.5281/zenodo.17310519>

Article Received on 25/08/2025

Article Revised on 14/09/2025

Article Accepted on 04/10/2025

ABSTRACT

Hyperlipidemia is a secondary metabolic dysregulation related to increased levels of triglycerides, cholesterol, and LDL in the serum, which is a major risk factor for premature cardiovascular disease such as atherosclerosis, hypertension, coronary heart disease, etc. This research aims to document and preserve the use of ethnomedicine to treat hyperlipidemia by people in the Cariu Region, Bogor, West Java, Indonesia. Fieldwork was carried out from May to June 2025 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 Cariu Region to treat hyperlipidemia. Among the various plant parts used, leaves (56.7%) are most often used in making medicine, followed by fruit (23.3%), rhizome (10.0%), stem, rind, and seeds (3.3% respectively). Meanwhile, the most frequently used preparation method was infusion (56.7%), followed by decoction (20.0%), juice (20.0%), and paste (3.3%). The research results confirm that the Sundanese people in the Cariu 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 Cariu Region, so that the availability of medicinal plants in the region is maintained.

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

INTRODUCTION

Hyperlipidemia is a predictor of coronary artery disease (CAD). The prevalence of this disease is quite high and is increasing in both developed and developing countries around the world.^[1] Hyperlipidemia is an important risk factor in the initiation and progression 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 blood serum and plasma 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 occur 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 search for new antihyperlipidemia agents derived from natural ingredients in the form of herbal plants. Compared with conventional medicines, herbal plants provide many advantages, including cost effectiveness, broad cultural acceptance, ease of accessibility, and lower side effects.^[6]

Medicinal plants are the most important and sometimes the only source of hyperlipidemia treatment. This is because medicinal plants are culturally acceptable, easy to access, and cheap compared to modern medicine.^[7-9] Indonesia is the second largest country in the world with forest biodiversity, where there are 28,000 plant species and 2,500 of these species are medicinal plants.^[10-12] Currently, research to obtain new anti-wound drugs derived from natural ingredients continues to be carried out, one of which is through exploring active compounds from natural ingredients, especially medicinal plants which have traditionally been used by people to treat hyperlipidemia in various regions in Indonesia.^[13,14] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially for treating hyperlipidemia, is the Cariu Region. This research aims to obtain detailed information about the use of herbal plants for alternative hyperlipidemia therapy in Cariu Region, Bogor, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Cariu is located in Bogor Regency, West Java, Indonesia, with an area of 84.81 km². This area has an altitude of 173 meters above sea level with an average maximum air temperature of 29°C and a minimum of 23°C. Cariu is located between 06°29' 56.43" South Latitude and 107°8' 17.92" East Longitude. This region is a tropical climate area that is mostly inhabited by Sundanese tribes (90%) and other tribes (10%). 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 May to June 2025 in the Cariu Region, Bogor, 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 about local plant names, plant parts used, preparation methods and administration methods (e.g., infusion, topical, 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.^[15] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.^[16] 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 (56.7%) are most often used in making medicine, followed by fruit (23.3%), rhizome (10.0%), stem, rind, and seeds (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.^[17] Meanwhile, the most frequently used preparation method was infusion (56.7%), followed by decoction (20.0%), juice (20.0%), and paste (3.3%). These results are in line with previous research which reported that the forms of traditional medicine most widely used by the community were infusions and decoctions.^[15]

Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Cariu, Bogor, 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	Juice	50 cloves once a day
2	<i>Aloe vera</i> L.	Xanthorrhoeaceae	Lidah buaya	Stem	Paste	150 grams once a day
3	<i>Annona muricata</i> L.	Annonaceae	Sirsak	Leaf	Infusion	100 grams once a day
4	<i>Apium graveolens</i> L.	Apiaceae	Seledri	Leaf	Infusion	150 grams once a day
5	<i>Averrhoa carambola</i> L.	Oxalidaceae	Belimbing	Fruit	Infusion	200 mL once a day
6	<i>Carica papaya</i> L.	Caricaceae	Pepaya	Leaf	Decoction	100 grams once a day
7	<i>Citrus aurantiifolia</i> (Cristm.) Swingle	Rutaceae	Jeruk Nipis	Fruit	Juice	5 mL/kg once a day
8	<i>Citrus maxima</i> (Burm.) Merr.	Rutaceae	Jeruk Bali	Rind	Infusion	100 grams once a day
9	<i>Curcuma longa</i> L.	Zingiberaceae	Kunyit	Rhizome	Infusion	300 grams once a day
10	<i>Cymbopogon nardus</i>	Poaceae	Sereh Wangi	Leaf	Infusion	100 grams once a day

11	<i>Daucus carota</i> L.	Apiaceae	Wortel	Fruit	Juice	300 grams once a day
12	<i>Dracaena angustifolia</i> (Medik.) Roxb.	Asparagaceae	Suji	Leaf	Infusion	50 grams once a day
13	<i>Glycine max</i> L.	Fabaceae	Kacang Kedelai	Seed	Juice	50 grams once a day
14	<i>Malus sylvestris</i> Mill	Rosaceae	Apel	Fruit	Juice	100 mL once a day
15	<i>Mentha longifolia</i> L.	Lamiaceae	Mint	Leaf	Infusion	5 grams once a day
16	<i>Momordica charantia</i> L.	Cucurbitaceae	Pare	Leaf	Decoction	10 grams once a day
17	<i>Morinda citrifolia</i> L.	Rubiaceae	Mengkudu	Fruit	Infusion	200 grams once a day
18	<i>Moringa oleifera</i> Lamk.	Moringaceae	Kelor	Leaf	Decoction	200 grams once a day
19	<i>Morus</i> L.	Moraceae	Murbei	Leaf	Infusion	100 grams once a day
20	<i>Murraya koenigii</i> (L.) Sprengel	Lamiaceae	Kari	Leaf	Infusion	50 grams once a day
21	<i>Pandanus amaryllifolius</i> Roxb.	Pandanaceae	Pandan	Leaf	Infusion	100 grams once a day
22	<i>Persea americana</i> Mill.	Lauraceae	Alpukat	Fruit	Juice	500 grams once a day
23	<i>Phaseolus vulgaris</i> L.	Fabaceae	Buncis	Fruit	Infusion	50 grams once a day
24	<i>Physalis angulata</i>	Solanaceae	Ciplukan	Leaf	Infusion	30 grams once a day
25	<i>Psidium guajava</i> L.	Myrtaceae	Jambu biji	Leaf	Decoction	100 grams once a day
26	<i>Salvia rosmarinus</i> Spenn	Lamiaceae	Rosemari	Leaf	Infusion	50 grams once a day
27	<i>Syzygium polyanthum</i> (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	200 mL once a day
28	<i>Tamarindus indica</i> L.	Fabaceae	Asam Jawa	Leaf	Infusion	10 grams once a day
29	<i>Vernonia amygdalina</i> Del	Asteraceae	Daun Afrika	Leaf	Infusion	200 grams once a day
30	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	100 grams once a day

CONCLUSIONS

The practice of treatment using traditional medicinal plants is an important strategy for maintaining knowledge about complementary and alternative medicine in the health care system. In addition, ethnopharmacological studies provide important information for guidance in the bioprospecting of new drugs of plant origin. The results of this study confirm that people in the Cariu Region still rely heavily on medicinal plants for their health care system, especially 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 Cariu Region, so that the availability of medicinal plants in the region is maintained.

REFERENCES

- Sahebkar A, Beccuti G, Simental-Mendía LE, Nobili V, Bo S. Nigella sativa (black seed) effects on plasma lipid concentrations in humans: A systematic review and meta-analysis of randomized placebo-controlled trials. *Pharmacol Res.* 2016; 106: 37-50.
- Alkandahri MY, Kusumiyati K, Renggana H, Arfania M, Frianto D, Wahyuningsih ES, et al. Antihyperlipidemic activity of extract and fractions of *Castanopsis costata* leaves on rats fed with high cholesterol diet. *RASĀYAN J Chem.* 2022; 15(4): 2350-2358.
- Ghule BV, Ghante MH, Saoji AN, Yeole PG. Antihyperlipidemic effect of the methanolic extract from *Lagenaria siceraria* Stand. fruit in hyperlipidemic rats. *J Ethnopharmacol.* 2009; 124(2): 333-337.
- Bidkar JS, Ghanwat DD, Bhujbal MD, Dama GY. Anti-hyperlipidemic activity of Cucumis melo fruit peel extracts in high cholesterol diet induced hyperlipidemia in rats. *J Complement Integr Med.* 2012; 9(1): 1-18.
- Carvalho AAS, Lima ÜWP, Valiente RA. Statin and fibrate associated myopathy: study of eight patients. *Arquivos de Neuro-Psiquiatria.* 2004; 62(2a): 257-261.
- Sakthiswary R, Zakaria Z, Das S. Diabetes mellitus: Treatment challenges and the role of some herbal therapies. *Middle-East J Sci Res.* 2014; 20(7): 786-798.
- Alkandahri MY, Berbudi A, Subarnas A. Active compounds and antimalaria properties of some medicinal plants in Indonesia – A review. *Sys Rev Pharm.* 2018; 9(1): 64-69.
- Alkandahri MY, Maulana YE, Subarnas A, Kwarteng A, Berbudi A. Antimalarial activity of extract and fractions of *Cayratia trifolia* (L.) Domin. *Int J Pharm Res.* 2020; 12(1): 1435-1441.

9. Setiawan MA, Fuadah TZ, Ningsih DU, Nabil M, Nababan A, Nurhabibah I, et al. The genus *Begonia* (Begoniaceae): A review of pharmacological studies. *Eur J Biomed Pharm Sci*, 2024; 11(3): 04-07.
10. Alkandahri MY, Sujana D, Hasyim DM, Shafirany MZ, Sulastri L, Arfania M, et al. Antidiabetic activity of extract and fractions of *Castanopsis costata* leaves on alloxan-induced diabetic mice. *Pharmacogn J*, 2021; 13(6)Suppl: 1589-1593.
11. Zulkarnaen P, Fadila N, Fadhilah LN, Kartika, Kardila K, Laely N, et al. Pharmacological activity of *Selaginella doederleinii* Hieron: An updated review. *Eur J Pharm Med Res*, 2024; 11(3): 17-20.
12. Alkandahri MY, Patala R, Berbudi A, Subarnas A. Antimalarial activity of curcumin and kaempferol using structure based drug design method. *J Adv Pharm Educ Res*, 2021; 11(4): 86-90.
13. Alkandahri MY, Arfania M, Abriyani E, Ridwanuloh D, Farhamzah, Fikayuniar L, et al. Evaluation of antioxidant and antipyretic effects of ethanolic extract of cep-cepan leaves (*Castanopsis costata* (Blume) A.DC). *J Adv Pharm Educ Res*, 2022; 12(3): 107-112.
14. Nuraeni E, Alkandahri MY, Tanuwidjaja SM, Fadhilah KN, Kurnia GS, Indah D, et al. Ethnopharmacological study of medicinal plants in the Rawamerta Region Karawang, West Java, Indonesia. *Open Access Maced J Med Sci*, 2022; 10(A): 1560-1564.
15. Bieski IGC, Santos FR, de Oliveira RM, Espinosa MM, Macedo M, Albuquerque UP, de Oliveira Martins DT. Ethnopharmacology of medicinal plants of the Pantanal Region (Mato Grosso, Brazil). *Evid Based Complement Alternat Med*. 2012; 2012: 1-36.
16. Cronquist A. The evolution classification of flowering plants. The New York Botanical Garden, New York, NY, USA, 2nd edition, 1988.
17. Ahmed S, Ahmad M, Swami BL, Ikram S. A review on plants extract mediated synthesis of silver nanoparticles for antimicrobial applications: Agreeen expertise. *J Adv Res*. 2016; 7(1): 17-28.