



ETHNOPHARMACOLOGICAL STUDY OF ANTIHYPERLIPIDEMIC IN THE BUNGURSARI REGION, PURWAKARTA, 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. This research aims to document and preserve the use of ethnomedicine to treat hyperlipidemia by people in the Bungursari Region, Purwakarta, 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 study reports that 30 plant species are commonly used by people in the Bungursari 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 Bungursari 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 Bungursari Region, so that the availability of medicinal plants in the region is maintained.

KEYWORDS: Traditional medicine, Ethnomedicinal plants, Bungursari 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] 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 Bungursari Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for hyperlipidemia in Bungursari Region, Purwakarta, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Bungursari is located in Purwakarta Regency, West Java, Indonesia, with an area of 54.66 km². This area has an altitude of 500 meters above sea level with an average maximum air temperature of 31°C and a minimum of 23°C. Moreover, it is located between 06°28'56" South Latitude and 107°28'42" 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 3,093 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 Bungursari 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

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%). 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.^[12] 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.^[10]

Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Bungursari, Purwakarta, 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 | 20 grams once a day |
| 2 | <i>Aloe vera</i> Burm.f., | Asphodelaceae | Lidah Buaya | Stem | Decoction | 100 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. | <u>Annonaceae</u> | Sirsak | Leaf | Infusion | 200 grams once a day |
| 5 | <i>Anredera cordifolia</i> (Ten.) Steenis | Basellaceae | Binahong | Leaf | Decoction | 100 grams once a day |
| 6 | <i>Averrhoa carambola</i> L. | <u>Oxalidaceae</u> | Belimbing | Leaf | Infusion | 50 grams once a day |
| 7 | <i>Carica papaya</i> L. | <u>Caricaceae</u> | Pepaya | Leaf | Decoction | 400 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 | 80 grams once a day |

| | | | | | | |
|----|--|----------------------|--------------|---------|-----------|----------------------|
| 10 | <i>Clitoria ternatea</i> L. | Fabaceae | Bunga Telang | Flower | Decoction | 50 grams once a day |
| 11 | <i>Cosmos caudatus</i> Kunth | Asteraceae | Kenikir | Leaf | Decoction | 100 grams once a day |
| 12 | <i>Curcuma longa</i> L. | <u>Zingiberaceae</u> | Kunyit | Rhizome | Infusion | 150 grams once a day |
| 13 | <i>Garcinia mangostana</i> L. | Clusiaceae | Manggis | Rind | Infusion | 500 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 | 200 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. | <u>Moringaceae</u> | Kelor | Leaf | Decoction | 100 grams once a day |
| 20 | <i>Nigella sativa</i> L. | Ranunculaceae | Jinten Hitam | Seed | Decoction | 200 grams once a day |
| 21 | <i>Ocimum tenuiflorum</i> L. | Lamiaceae | Kemangi | Leaf | Decoction | 50 grams once a day |
| 22 | <i>Persea americana</i> Mill. | Lauraceae | Alpukat | Seed | Decoction | 50 grams once a day |
| 23 | <i>Phaleria macrocarpa</i> (Scheff.) Boerl | Thymelaceae | Mahkota Dewa | Fruit | Decoction | 500 grams once a day |
| 24 | <i>Phyllanthus niruri</i> L. | Phyllanthaceae | Meniran | Leaf | Decoction | 35 grams once a day |
| 25 | <i>Piper betle</i> L. | Piperaceae | Sirih | Leaf | Decoction | 100 grams once a day |
| 26 | <i>Psidium guajava</i> L. | <u>Myrtaceae</u> | Jambu Biji | Leaf | Decoction | 150 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 | <u>Myrtaceae</u> | Salam | Leaf | Decoction | 150 grams once a day |
| 29 | <i>Tinospora crispa</i> L. | Menispermaceae | Baratawali | Leaf | Decoction | 100 grams once a day |
| 30 | <i>Zingiber officinale</i> Rosc. | Zingiberaceae | Jahe | Rhizome | Decoction | 200 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 Bungursari 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

Bungursari Region, so that the availability of medicinal plants in the region is maintained.

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