

**ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED TO TREAT DIABETES
MELLITUS IN THE CIASSEM REGION, SUBANG, WEST JAVA, INDONESIA**

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ABSTRACT

Diabetes mellitus (DM), one of the major public health problems worldwide, is a metabolic disorder of multiple etiologies distinguished by a failure of glucose homeostasis with disturbances of carbohydrate, fat and protein metabolism as a result of defects in insulin secretion and/or insulin action. Glycemic control is the main target of the treatment to prevent micro- and macrovascular and neurological complications of DM. This research aims to document and preserve the use of ethnomedicine to treat DM by people in the Ciassem Region, Subang, 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 research reports that 30 plant species are commonly used by people in the Ciassem Region to treat DM. Among the various plant parts used, leaves (63.3%) are most frequently used in making medicines, followed by rhizomes (13.3%), fruit (6.7%), flowers (6.7%), stem, rind, and seed (respectively 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 Ciassem Region still rely heavily on medicinal plants for their health care system, especially for the treatment of DM with the most frequently used parts of the leaves and their use in decoctions and infusions.

KEYWORDS: Traditional medicine, Ethnomedicinal plants, Ciassem Region, Diabetes Mellitus.

INTRODUCTION

Diabetes mellitus (DM) is a chronic and non-communicable leading public health problem. DM is a metabolic disorder of carbohydrate due to insulin deficiency resulting from dysfunction of pancreatic beta cells. Over the past decade, diabetes prevalence has risen faster in low- and middle-income countries compared to high-income countries. One of the risk factors being the overweight with possible complications include heart attack, stroke, kidney failure, leg amputation, vision loss,

and nerve damage. In addition, during pregnancy, poorly controlled diabetes increases the risk of fetal death and other complications.^[1] Diabetes is a potential public health problem in Malaysia and according to the National Health Survey the Ministry of Health, Malaysia reported that the prevalence of diabetes was 13.80% for men and 14.54% for women. In terms of the main ethnic groups, the most common is in the Indian's subpopulation (25.10%), followed by the Malays (15.25%), Chinese (12.87%), Bumiputera (8.62%), and

others (6.91%).^[2] About two to three decades ago, most of the drugs were obtained from natural sources. Herbal plants have been used for the treatment of various disorders with no sound scientific knowledge on its function, phyto-chemistry, and adverse effects.^[3]

Medicinal plants are the most important and sometimes the only source of DM treatment. This is because medicinal plants are culturally acceptable, easy to access, and cheap compared to modern medicine.^[4-6] 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.^[7-9] Currently, research to obtain new anti-DM 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.^[10,11] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially for treating DM, is the Ciasem Region. This research aims to obtain detailed information about the use of herbal plants for alternative DM therapy in Ciasem Region, Subang, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Ciasem is located in Subang Regency, West Java, Indonesia, with an area of 117.19 km². This area has an altitude of 10 meters above sea level with an average maximum air temperature of 27°C and a minimum of 32°C. Ciasem is located between 06°19'17" South Latitude and 107°41'31" 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 2,810 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 Ciasem Region, Subang, 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.^[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 30 plant species are commonly used by local people to treat DM (Table 1). This shows that the study location is affordable in terms of biodiversity. Among the various plant parts used, leaves (63.3%) are most frequently used in making medicines, followed by rhizomes (13.3%), fruit (6.7%), flowers (6.7%), stem, rind, and seed (respectively 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.^[14] 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.^[12]

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

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	<i>Alpinia galanga</i> L.	Zingiberaceae	Lengkuas	Rhizome	Decoction	50 grams once a day
2	<i>Andrographis paniculata</i> Nees	Acanthaceae	Sambiloto	Leaf	Decoction	100 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	Decoction	50 grams once a day
5	<i>Artocarpus altilis</i> (Park.) Forsberg	Moraceae	Sukun	Leaf	Decoction	50 grams once a day
6	<i>Artocarpus</i>	Moraceae	Nangka	Leaf	Decoction	100 grams

	<i>heterophyllus</i> Lamk.					once a day
7	<i>Carica papaya</i> L.	Caricaceae	Pepaya	Flower	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>Cosmos caudatus</i> Kunth	Asteraceae	Kenikir	Leaf	Decoction	10 grams once a day
10	<i>Curcuma longa</i> L.	Zingiberaceae	Kunyit	Rhizome	Infusion	150 grams once a day
11	<i>Etlingera elatior</i> (Jack) R.M.Sm.)	Zingiberaceae	Kecombrang	Leaf	Decoction	150 grams once a day
12	<i>Garcinia mangostana</i> L.	Clusiaceae	Manggis	Rind	Infusion	150 grams once a day
13	<i>Gynura procumbens</i> (Lour.) Merr.	Asteraceae	Sambung Nyawa	Leaf	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	50 grams once a day
16	<i>Mangifera indica</i> L.	Anacardiaceae	Mangga	Leaf	Decoction	50 grams once a day
17	<i>Momordica charantia</i> L.	Cucurbitaceae	Pare	Leaf	Decoction	150 grams once a day
18	<i>Morinda citrifolia</i> L.	Rubiaceae	Mengkudu	Fruit	Infusion	20 grams once a day
19	<i>Moringa oleifera</i> Lamk.	Moringaceae	Kelor	Leaf	Decoction	100 grams once a day
20	<i>Nephelium lappaceum</i> L.	Sapindaceae	Rambutan	Leaf	Decoction	50 grams once a day
21	<i>Ocimum basilicum</i> L.	Lamiaceae	Kemangi	Leaf	Decoction	150 grams once a day
22	<i>Phaleria macrocarpa</i> (Scheff.) Boerl)	Thymelaceae	Mahkota Dewa	Fruit	Decoction	150 grams once a day
23	<i>Phyllanthus niruri</i> L.	Phyllanthaceae	Meniran	Leaf	Decoction	150 grams once a day
24	<i>Piper betle</i> L.	Piperaceae	Sirih	Leaf	Decoction	100 grams once a day
25	<i>Smallanthus sonchifolius</i> H.Rob.	Asteraceae	Daun Insulin	Leaf	Decoction	150 grams once a day
26	<i>Swietenia macrophylla</i> King.	Meliaceae	Mahoni	Seed	Decoction	100 grams once a day
27	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamblang	Leaf	Infusion	100 grams once a day
28	<i>Syzygium polyanthum</i> (Wight) Walpers	Myrtaceae	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	150 grams once a day

CONCLUSIONS

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

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