



**ETHNOPHARMACOLOGICAL STUDY OF ANTIDIABETIC IN THE TEGALWARU  
REGION, KARAWANG, WEST JAVA, INDONESIA**

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**ABSTRACT**

Diabetes mellitus (DM) is a chronic, progressive, incompletely understood metabolic condition chiefly characterized by hyperglycemia. This research aims to document and preserve the use of ethnomedicine to treat DM by people in the Tegalwaru Region, Karawang, West Java, Indonesia. Fieldwork was carried out from November to December 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](http://www.plantlist.org)) and the International Plant Name Index ([www.ipni.org](http://www.ipni.org)). This research reports that 30 plant species are commonly used by people in the Tegalwaru 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 Tegalwaru 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, Tegalwaru Region, Diabetes Mellitus.

**INTRODUCTION**

Diabetes mellitus (DM) has emerged as one of the most serious and common chronic diseases of our time. With the aggravation of aging and urbanization, the incidence rate of diabetes is rapidly increased. The global prevalence of diabetes was estimated at 10.5 % (536.6 million people) in 2021, which is expected to rise to 12.2 % (783.2 million people) by 2045, of which type 2 diabetes (T2DM) accounts for 90%.<sup>[1]</sup> T2DM are induced by reduced insulin sensitivity of systemic cells and/or reduced insulin secretion due to impaired pancreatic  $\beta$ -cell function.<sup>[2]</sup> T2DM seriously threatens human health, and the currently approved T2DM drugs mainly include metformin, rosiglitazone, and sitagliptin etc., which have

significant side effects for long-term use.<sup>[3]</sup> Hence, it is valuable and relevant to find new drugs for the prevention and treatment of type 2 diabetes.

The use of medicinal plants for the treatment of various diseases has increased throughout the world because they are considered much safer than synthetic drugs.<sup>[4,5]</sup> Research to obtain new drugs to treat DM originating 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 DM in various countries, especially Indonesia.<sup>[6,7]</sup> One of the Region in Indonesia that still uses herbal plants as an

alternative treatment, especially for treating DM, is Tegalwaru Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for DM in Tegalwaru Region, Karawang, West Java, Indonesia using a field survey method.

## MATERIALS AND METHODS

### Study Area

Tegalwaru is located in Karawang Regency, West Java, Indonesia, with an area of 52.14 km<sup>2</sup>. This area has an altitude of 104 meters above sea level with an average maximum air temperature of 34°C and a minimum of 24°C. Moreover, it is located between 06°30'45.9" South Latitude and 107°13'39" East Longitude. This area 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 1,500 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 November to December 2025 in the Tegalwaru Region, Karawang, 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.<sup>[8]</sup> The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.<sup>[9]</sup> Plant names were checked against the Plant List ([www.plantlist.org](http://www.plantlist.org)) and the International Plant Name Index ([www.ipni.org](http://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.<sup>[10]</sup> 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.<sup>[8]</sup>

**Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Tegalwaru, Karawang, 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	10 grams once a day
2	<i>Andrographis paniculata</i> Nees	Acanthaceae	Sambiloto	Leaf	Decoction	15 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	10 grams once a day
5	<i>Artocarpus altilis</i> (Park.) Forsberg	Moraceae	Sukun	Leaf	Decoction	50 grams once a day
6	<i>Artocarpus heterophyllus</i> Lamk.	Moraceae	Nangka	Leaf	Decoction	50 grams once a day
7	<i>Carica papaya</i> L.	Caricaceae	Pepaya	Flower	Decoction	10 grams once a day
8	<i>Cinnamomum verum</i> J.Presl	Lauraceae	Kayu Manis	Stem	Decoction	50 grams once a day
9	<i>Cosmos caudatus</i> Kunth	Asteraceae	Kenikir	Leaf	Decoction	50 grams once a day
10	<i>Curcuma longa</i> L.	Zingiberaceae	Kunyit	Rhizome	Infusion	10 grams once a day
11	<i>Etilingera elatior</i> (Jack) R.M.Sm.)	Zingiberaceae	Kecombrang	Leaf	Decoction	50 grams once a day
12	<i>Garcinia mangostana</i> L.	Clusiaceae	Manggis	Rind	Infusion	100 grams once a day
13	<i>Gynura procumbens</i> (Lour.) Merr.	Asteraceae	Sambung Nyawa	Leaf	Infusion	50 grams once a day

14	<i>Hibiscus sabdariffa</i> L.	Malvaceae	Rosela	Flower	Decoction	80 grams once a day
15	<i>Kaempferia galanga</i> L.	Zingiberaceae	Kencur	Rhizome	Infusion	100 grams once a day
16	<i>Mangifera indica</i> L.	Anacardiaceae	Mangga	Leaf	Decoction	10 grams once a day
17	<i>Momordica charantia</i> L.	Cucurbitaceae	Pare	Leaf	Decoction	10 grams once a day
18	<i>Morinda citrifolia</i> L.	Rubiaceae	Mengkudu	Fruit	Infusion	20 grams once a day
19	<i>Muntingia calabura</i> L.	Muntingiaceae	Seri	Leaf	Decoction	25 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	30 grams once a day
22	<i>Phaleria macrocarpa</i> (Scheff.) Boerl)	Thymelaceae	Mahkota Dewa	Fruit	Decoction	50 grams once a day
23	<i>Phyllanthus niruri</i> L.	Phyllanthaceae	Meniran	Leaf	Decoction	10 grams once a day
24	<i>Piper betle</i> L.	Piperaceae	Sirih	Leaf	Decoction	80 grams once a day
25	<i>Smallanthus sonchifolius</i> H.Rob.	Asteraceae	Daun Insulin	Leaf	Decoction	20 grams once a day
26	<i>Swietenia macrophylla</i> King.	Meliaceae	Mahoni	Seed	Decoction	10 grams once a day
27	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamblang	Leaf	Infusion	10 grams once a day
28	<i>Syzygium polyanthum</i> (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	25 grams once a day
29	<i>Tinospora crispa</i> L.	Menispermaceae	Baratawali	Leaf	Decoction	10 grams once a day
30	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	50 grams once a day

## CONCLUSIONS

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

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